

Farm Chemicals

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Farm Chemicals

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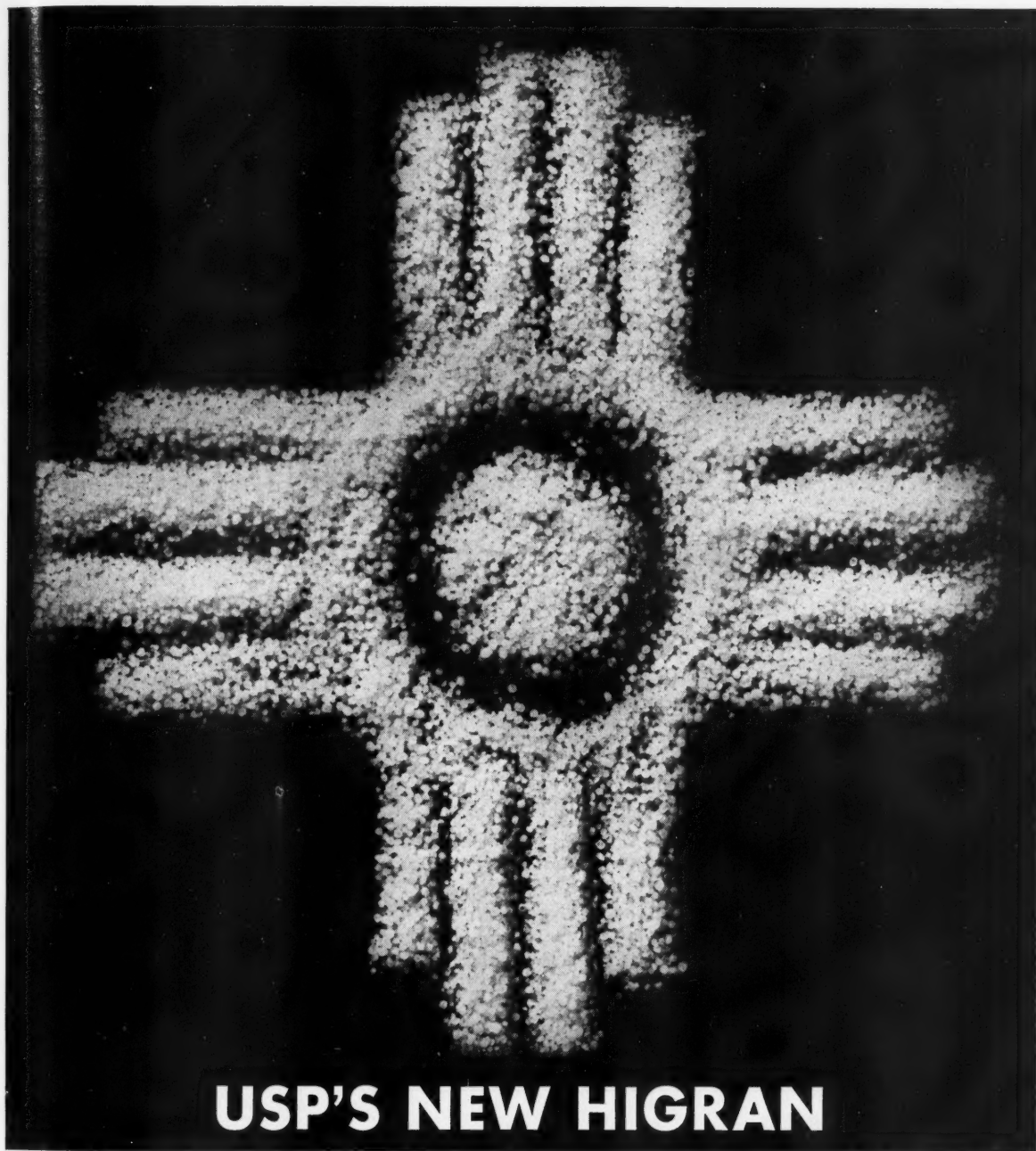
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USP'S NEW HIGRAN

SPECIALLY SIZED PARTICLES FOR MODERN FERTILIZERS

USP announces the FIRST Higrade Granular muriate of potash designed specifically for the manufacture of today's modern fertilizers. Its perfect whiteness attests to its purity—the highest now available in granular agricultural muriate of potash. Non-caking and free-flowing throughout, USP's new Higrade Granular potash contains 62/63% K_2O . A regular supply of this important new potash product is immediately available from the U.S. Potash Co.

USP also offers Higrade muriate of potash—62/63% K_2O and Granular muriate of potash—60% K_2O —both free-flowing and non-caking.

UNITED STATES POTASH COMPANY

DIVISION OF UNITED STATES BORAX & CHEMICAL CORPORATION
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Southern Sales Office: Rhodes-Haverly Building, Atlanta, Georgia



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FARM CHEMICALS

Business & Management

PHILLIPS PACIFIC PLANT IN PRODUCTION



Aerial view of the new Phillips Pacific plant.

Full-scale operations have begun at Phillips Pacific Chemical Co.'s Coulee anhydrous ammonia plant in the Tri-Cities area of southeastern Washington.

Located on the west bank of the Columbia River seven miles southeast of Kennewick and Pasco, the plant is designed to produce 200 tons a day of anhydrous ammonia.

It is owned jointly by Phillips Petroleum Co. and Pacific Northwest Pipeline Corp., and operated

by Phillips Chemical Co. W. D. Payton is plant manager.

Natural gas is supplied through Pacific Northwest's pipeline from the San Juan basin of New Mexico and Colorado.

The anhydrous ammonia will be marketed throughout the Northwest by Phillips Petroleum Co.'s Sales Dept., which has division offices in Spokane and Salt Lake City.

ITALIAN FIRM CONTRACTS FOR COMPLEX FERT PLANT

A contract to build a 400-600 T/D complex fertilizer plant recently was awarded Potasse & Engrais Chimiques by Societa Azienda Nazionale Idrogenazione Combustibili of Milano, Italy. The PEC carbonitric process will be utilized to produce a basic formula of 13-10-12.

Plants of this type are available in the U.S. through The Chemical and Industrial Corp., which has the exclusive right to license the PEC processes to users. Recently a plant of this type was completed

for California Spray-Chemical Corp. at Richmond, Calif. which is presently producing 15-15-15 and 22-22-0.

BERKELEY UPS CUPROUS CHLORIDE PRODUCTION

Berkeley Chemical Corp., Berkeley Heights, N. J. has completed new facilities for production of cuprous chloride. The addition represents a 100 per cent increase over previous capacity.

Millmaster Chemical Corp., sole sales agency for Berkeley, has been a supplier of cuprous chloride for many years.

ROHM & HAAS WINS SUIT AGAINST ROBERTS

Appeal from a lower court decision in a patent infringement suit has been decided in favor of Rohm & Haas Company by the U.S. Court of Appeals for the Fourth Circuit, the company recently announced. Rohm and Haas contended that the patent under which it sells its Dithane brand fungicide was being infringed by Roberts Chemical Co.

According to D. S. Frederick, R & H vice president, action in the company's suit on similar grounds against another firm, Chemical Insecticide Corp. and one of its dealers, filed in September 1955, which has been delayed pending the outcome of the suit against Roberts Chemical Co., will now be pressed.

BREA CHEMS. MERGED INTO COLLIER CARBON & CHEM.

Merger of Brea Chemicals, Inc. and R. T. Collier Corp., two subsidiaries of Union Oil Co. of California, was recently announced.

The new corporation is known as the Collier Carbon and Chemical Corp., with headquarters at 714 West Olympic Boulevard, Los Angeles. This corporation will continue to manufacture and market Brea Brand chemicals and will conduct its petro-chemical and carbon businesses as corporate divisions.



Reed



Collier

R. T. Collier, as president, is chief executive officer of the new corporation. For the past 11 years he has been president of the R. T. Collier Corporation.

Homer Reed is vice president of the new firm. Reed has been president of Brea Chemicals, Inc., since it was organized in 1952. Prior to that he had been chief engineer for Union Oil Co.

FARM CHEMICALS

THE MAN WITH THE



MULTIWALL PLAN

**UNION
PACKAGING SPECIALIST
BLAINE LOUDIN**

**lowers a
Multiwall
user's
overhead
\$37,584**



66 minus 27 = 37,584. Loose logic? Not for a large agricultural chemicals' firm whose Multiwall Packaging and materials handling system was recently reviewed and revised by Union Packaging Specialist Blaine Loudin.

The 27 represents a reduction in the company's labor force from an original staff of 66. The 37,584... seasonal dollar savings achieved following adoption of Union's recommendations for more efficient, economical operation.

**Union Multiwall Recommendations
are based on this 5-star
Packaging Efficiency Plan**



- DESIGN
- EQUIPMENT
- CONSTRUCTION
- SPECIFICATION CONTROL
- PLANT SURVEY

Among the new proposals: using a lateral bag conveyor for carloading. This improvement alone speeded handling and freed three men for other plant work.

The complete changeover was made using existing equipment and buildings with only slight modifications. Capital outlay expended by the company was paid

back in less than 13 months.

This is a typical case of Union's 5-Star Packaging Efficiency Plan in action. Write for full information.

**Better Multiwall performance
through better
planning**



UNION'S PACKAGE ENGINEERING DEPARTMENT will study your Multiwall bagging methods and equipment and make appropriate recommendations, regardless of the brand of Multiwalls you are now using.

UNION MULTIWALL BAGS

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233 BROADWAY, NEW YORK 7, N. Y.

6 POTASH PRODUCERS RESIGN FROM NPFI

MAJOR domestic potash producers, maintaining membership in both the American Potash Institute and the National Plant Food Institute, resigned recently from the N.P.F.I. because of greatly increased and what they consider to be inequitable N.P.F.I. assessments to finance its expanded program of activities.

The potash producers pointed out that the proposed new program of the National Plant Food Institute is basically similar to activities conducted by the Potash Institute since its formation in 1935. During that time the Potash Institute has spent more than \$10,000,000 in promoting balanced fertilization programs aimed at increasing the proper use of potash as well as other plant nutrients in the form of mixed fertilizers.

During the 22 years of A.P.I. activity the consumption of agricultural potash in this country has risen from 218,157 tons in 1935 to 2,103,127 tons in 1956. Nevertheless, the price of potash has not increased in the past 20 years, contrary to the general rise in most other materials.

Fred Coope, president of Potash Company of America and spokesman for the resigning member-companies, said the move was taken because the proposed dues were "extremely inequitable . . . for the great majority of potash companies who have for years supported the American Potash Institute . . . for a program of research, education and promotion which benefits the entire fertilizer industry."

The potash companies affected were American Potash & Chemical Corporation, Duval Sulphur & Potash Company, National Potash Company, Potash Company of America, Southwest Potash Corporation, and United States Potash Division of United States Borax & Chemical Corporation. Only one major potash producer has not been a member of A.P.I.

"We were already deeply committed to the expense of the American Potash Institute,"

Coope said, "and we concluded we could not bear the additional burden of this N.P.F.I. program."

Despite their resignation, the potash manufacturers endorse the fundamentals and principles of the N.P.F.I. program. The companies offered to continue their present contributions to the N.P.F.I. even though they have resigned.

A representative of one of the resigning companies said the 1956-57 budget for Potash Institute was \$611,000, while the total budget for N.P.F.I. was \$530,845 for the same period. This is in spite of the fact, which many people do not realize, that the potash producers form a very minor segment of the fertilizer industry. In the N.P.F.I. 1956-57 budget, based on the same levy on net sales for all, potash products were less than seven per cent of the total. Taking this situation into consideration, the disparity between Potash Institute member contributions and that of others to educational programs becomes highly inequitable. Financial support for the Potash Institute program has come from assessments of from one to two per cent of each member-company's annual gross sales.

An important part of the A.P.I. program has been the financing of research projects in more than 40 different states and provinces in the United States and Canada to provide both general and regional information on correct use of potash and other fertilizer materials. In addition, the A.P.I. has conducted a widespread educational campaign through advertising, publicity and field representatives to further the program, and has had the continued and active cooperation of Federal and State Departments of Agriculture since its organization.

Regional representatives for the A.P.I. engaged in their field research programs include E. T. York in the Northeast Area; J. Fielding Reed, C. W. Summerour, N. D. Morgan and E. H. Bailey in the South; Werner L. Nelson, H. L. Garrard and G. A. Wick-



strom in the Midwest; M. E. McCollam, Forest S. Fullmer and Grant Braun in the Pacific Coast Area, and R. P. Pennington in Canada. District offices are maintained in Atlanta, Georgia; San Jose, California; Lafayette, Indiana; Hamilton, Ontario, with National headquarters in Washington, D. C.

GRACE & PECHINEY TEAM UP TO MAKE SILICON

W. R. Grace & Co. and Pechiney, French chemical and metallurgical concern, announced recently the formation of a new company in the United States to produce high-purity elemental silicon and other semi-conductors.

The companies said that the plant, location for which has not yet been announced, will be operating in less than 12 months.

NEW FIRM TO BUILD PLANT IN INDIANA

Construction is reported about to start on a new 26,000 square foot pesticide and plant food warehouse in Jay county, north of Portland, Ind. It is being built by the Green Belt Chemical Co. of Indiana, a new firm capitalized at \$250,000.

The plant will be of wood and steel construction and when completed will be about 222 feet x 130 feet.

NEW CONSTRUCTION AT ATLAS MISSOURI PLANT

Atlas Powder Co. will replace its Atlas, Mo., nitric acid and ammonium nitrate facilities at a total cost of about \$4 million, president Ralph K. Gottshall announced recently. Work will begin immediately, with completion scheduled for March, 1958.

Chemical and Industrial Corp. has been granted the contract for design and construction of the acid unit.

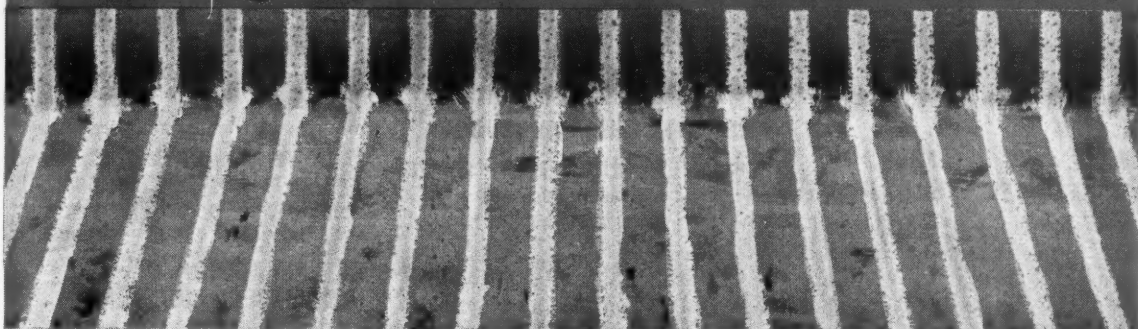
HEALTHY SOIL ...
HEALTHY PROFITS!



HIGH GRADE MURIATE OF POTASH

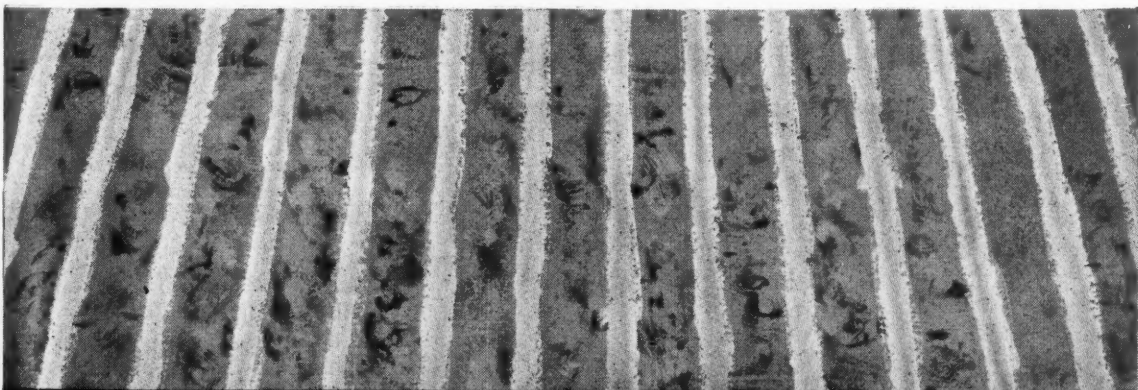
Duval Muriate of Potash—A vital element at low cost
for healthy soil and healthy profits.

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SALES DEVELOPMENT DEPT. FOR STAUFFER AG. CHEMS.

A new Sales Development Dept. has been set up by Stauffer Chemical Co.'s Agricultural Chemical Div. Headed by Francis E. Cook as manager, the department will be responsible for promoting and developing sales of newly developed agricultural chemicals.

Cook, who formerly was with Stauffer's Agricultural Chemical Research Dept., is a graduate of the University of California. Others assigned to the new department include William B. Shafer and Daniel R. Tuite.

The department will be headquartered in New York City.

PHOSPHATE ORE FOUND ON STAUFFER LAND IN IDA.

Exploration work conducted by San Francisco Chemical Co. for Stauffer Chemical Co. at Stauffer's Hot Springs, Idaho, phosphate rock property, has indicated a multi-million ton ore body. Extensive underground development work, which the company has carried through during the past three years, has estab-

lished that the Stauffer reserves include at least a million tons of easily mineable, high grade phosphate rock which can be used for economic manufacture of super-phosphates.

In addition, many times that tonnage of highgrade rock is indicated, and a vast quantity of lower grade phosphate shales have been proved out. The latter could be used as raw material for the electric furnace production of elemental phosphorous or might be beneficiated.

The company reported it does not plan immediate exploitation of this ore because it already has substantial reserves of phosphate rock in other properties it owns or has interests in, through affiliated companies, in Wyoming, Idaho and Utah.

H.J. BAKER NAMED EXCLUSIVE REP. FOR CHICAGO SLUDGE

On July 1, H. J. Baker & Bro. were named exclusive sales representatives for heat-dried activated Chicago Sludge.

Chicago sludge tests about 5 per cent nitrogen, 4 per cent available phosphoric acid, 75 per cent humus and trace materials. The company's announcement noted that it is available in bulk to the fertilizer industry and can be shipped by freight car and barge.

AP & CC FORMS SECTION FOR MARKET RESEARCH



Brown



Bills

A market research section has been formed in its Market Development Dept. by American Potash & Chemical Corp.

Dr. John L. Bills, formerly of Brea Chemicals, Inc., has joined AP&CC to head the new section, while Joseph W. Brown, previously with Kelco Co., has been named market research analyst.

Daniel S. Dinsmoor, vice president for planning and development, said the section was set up to provide information to assist management in the direction of the company's research and marketing programs on new products.

GC OPERATES NEW MISS. INSECTICIDE PLANT

A new high capacity plant for production of cotton insecticides is now in operation at Cleveland, Miss., reports General Chemical Div., Allied Chemical & Dye Corp. Known as Delta Works, the plant will utilize special new equipment designed by General Chemical's Engineering Dept. to materially increase the company's output of cotton pesticides.

All types of cotton dusts will be formulated at the new location, said General Chemical, as well as a full range of liquid cotton pesticides.

NEW YORK QUININE MERGED INTO PENICK

New York Quinine & Chemical Works, a wholly-owned subsidiary, was merged into S. B. Penick & Co. on May 31. NYQ now is known officially as "New York Quinine & Chemical Works, Division of S. B. Penick & Co."

The company reports that the change is intended only to simplify internal corporate structure, and no change in operations is contemplated.

NEW DESIGN FOR DIAMOND TANKS



Here is the first in a fleet of nearly 1,000 newly-designed Diamond Alkali Co. tank cars which will be refinished within the next two years. Background is gull gray, the trade mark, red-and-black, with a logotype of Diamond Chemicals painted in black.

The truth about Tabutrex

23

**PROVEN
ADVANTAGES**
that can be the
most profitable
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your files!

TABUTREX has given "insect repellency" an entirely new meaning. Now, for the first time, it is possible to meet the vast consumer demand for a **SAFE, ECONOMIC, TRULY EFFECTIVE** fly, roach and ant repellent.

TABUTREX has been approved for use on dairy cattle.

TABUTREX builds a barrier against house flies, biting flies, roaches and ants.

TABUTREX repels even resistant flies and roaches...they just can't stand it (Humans and animals don't even notice it.)

TABUTREX is compatible with toxicants, but can also stand squarely alone. Soluble in oil...emulsifiable in water.

TABUTREX with its 23 proven advantages is certain to become one of your most important, most valuable, most profitable insect-control tools.

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-----FILL IN COUPON:-----
Glenn Chemical Co., Inc. DEPT. FW
2735 N. Ashland Ave. Chicago 14, Illinois

Please rush me all important data on **TABUTREX** insect repellent.

Name

Address

City

Zone

State

Type of Business

(Please put specific inquiries on separate sheet)

VAST CONSUMER MARKET

TRUE REPELLENCY

STABLE IN STORAGE

STABLE IN MOISTURE

STABLE IN LIGHT

SAFE TO HANDLE

REPELS STABLE FLIES

REPELS ROACHES, ANTS

REPELS RESISTANT INSECTS

ODORLESS

NO SKIN IRRITATION

NO RESISTANCE

NO INSECT CONTAMINATION

NO INHALATION HAZARD

NON-CORROSIVE

MISCIBLE IN SOLVENTS

LASTS LONGER

EFFECTIVE ALONE

EASY TO FORMULATE

COSTS LESS

COMPATIBLE WITH TOXICANTS

CAN BE USED AROUND FOOD

APPROVED FOR DAIRY CATTLE

G
Tabutrex
INSECT REPELLENT

GLENN Chemical Co., Inc. • 2735 No. Ashland Ave. • Chicago 14, Ill.

AUGUST, 1957

over $\frac{1}{4}$ million tons have switched to



Round-the-clock production at Bonnie takes the push out of peak-season demands. Mammoth off-season storage capacity swallows up the seven-day-a-week production, stores it safely until you need it. And the industry's finest delivery schedules assure you high-quality triple when you need it.

International's natural curing helps you cut costs

• It's the natural curing process that gives you that "something-extra" quality of the triple super from Bonnie.

It helps you cut costs . . . gives you better control of manufacturing conditions and chemical reactions . . . stabilizes your formulation problems . . . and reduces the delivered unit cost of (P₂O₅). Here's what natural curing means to you:

Uniform particle size . . . for dependable ammoniation results.

Finer texture . . . for more complete ammoniation in every batch.

Stabilized product . . . for better chemical control.

Constant high analysis . . . with guaranteed minimum of 46% A.P.A.

Uniform high quality . . . for increased (P₂O₅) availability.

To guarantee this top quality triple from a plant as large as Bonnie required extra planning in

plant design . . . extra capacity for a dependable supply . . . extra time to complete the five-week natural curing process . . . and extra care and quality control to assure uniform results in batch after batch.

This is the way Bonnie was built. And the results of the past year have proved Bonnie can deliver. Bonnie is dependable . . . and Bonnie can produce the kind of triple you want.

of Triple Super Sales to Bonnie

The reason:

*trustworthy service
and delivery plus superior
results with International's
natural-cured triple*

Here's why, in the actual words of Bonnie customers:

Others have recommended you

"Several nitrogen producers have recommended your product to us because of its excellent ammoniation. They were right."

Missouri

You live up to delivery promises

"What we like about doing business with International is your service, particularly regarding delivery. Our material has always been shipped when requested."

Indiana

Your triple stores better

"Last September, we stored some of your triple next to competitive materials from two other suppliers. Six months later, the other two piles were set up hard enough to be blasted. Any lumps in your product could be broken with your fingers."

Minnesota

Your triple is a better product

"This is the best triple we have ever used for ammoniation."

Ontario

We get better ammoniation results

"We can put 600 lbs. of Urana 10 in with 1,400 lbs. of triple."

New York

Your Triple holds more nitrogen

"We have been amazed with the results. With a very high humidity we have been using 500 lbs. of nitrogen solution with 1,400 lbs. of your triple. Never before have we been able to get over 360 lbs. of this solution in the mix."

Maine

We save money with your triple

"We like the constant high analysis of your product. It aids us in formulation and reduces the unit delivered cost."

North Dakota

You meet delivery schedules

"We certainly appreciate the way International came through on schedule during the rush season."

Arkansas

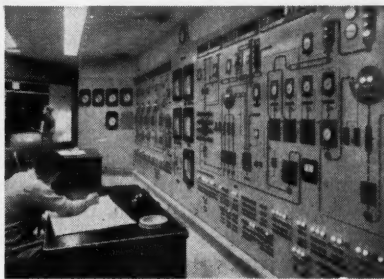
**names on request*

These are just a few of the reasons why this year, the big switch in triple super sales is to Bonnie — giant production facilities . . . prompt delivery . . . superior quality . . . and outstanding ammoniation results.

So this year, for a better product, and service you can depend upon, look to International Minerals & Chemical Corporation. You'll be glad you did.



This 85,000-ton curing unit — as big as two, full-sized football fields — is one example of the time and big capacity needed to produce natural-cured triple.



These "doodads" and dials get results . . . guard the uniformity and quality of every batch of triple super from Bonnie . . . help assure you of top results in ammoniation.



INTERNATIONAL MINERALS & CHEMICAL CORPORATION

Phosphate Chemicals Division • General Offices: 20 North Wacker Drive, Chicago 6

FARM CHEMICALS

People

American Agricultural Chemicals Co. R. L. Waring, Jr., former manager of Baltimore sales, becomes responsible for all phases of fertilizer sales operations as manager, fertilizer sales, for the firm's New York office.

Also announced was transfer of John A. Layton to the Production Dept. at New York and of Harry M. Rau to the Baltimore Works as superintendent.

American Potash & Chemical Corp. Modesto L. Leonardi has been named as manager of plant production at the company's main plant at Trona, Calif. Leonardi has been with AP & CC since 1939, after completing his education at the University of Nevada.



Leonardi



Anderson

A. J. Anderson, formerly manager of plant production, has been appointed advisory engineer for the Trona facility.

Armour Fertilizer Works. V. H. Hair, general credit manager, retired June 15 after almost 45 years' service with Armour. He is succeeded by James H. Charles, former assistant general credit manager.

Atlas Powder Co. Preston W. Parvis, secretary and treasurer, has been elected a director succeeding William J. Wiley, who has resigned. D. J. Carroll Copps and Edward J. Goett,

vice presidents, have been designated senior vice presidents and Robert J. Reilly, director of the Economic Evaluation Dept. was also elected an assistant treasurer.

Best Fertilizers Co. New vice president in charge of production is Julian A. Rogers. In this capacity, Rogers will have charge of the company plant at Lathrop, Calif.



Rogers

Formerly with W. R. Grace & Co., Rogers was head of the Manufacturing Dept. of its polyethylene plant in Baton Rouge, La.

R. H. Bogle Co. R. E. Stuart, plant superintendent, died in Garfield Memorial Hospital, Washington, D. C., June 24, after a long illness.

Newly named plant superintendent is William C. Parrish, Jr., who has been with the company since May 1944 as a service engineer. James M. Brasfield is named sales engineer.

California Spray-Chemical Corp. Appointment of Frank J. Juchter as vice president and member of the board of directors was announced by A. W. Mohr, president, at a meeting of the board on June 20.

Calspray appointments: Dr. Donald S. Marshall to manager, Seed Treating Div., with headquarters at Richmond; Drs. Lowell G. Nelson and Vern L. Marble as district agronomists, locating at Portland and Fresno respectively; Dr. Richard B. Wessel as field research supervisor, east; John G. Neckerman

as a sales representative in North Dakota. In the Advertising Div.: Joseph A. Aimar as supervisor of staff services; Charles L. Deaton as merchandising specialist; and Geoffrey W. Fullick, advertising technician.

Chipman Chemicals Ltd. S. G. Pugh has been named western district manager of the firm. He will be located at Winnipeg and will be in charge of sales and production operations of the company in western Canada.

Commercial Solvents Corp. James A. McConnell has been elected a director of Commercial Solvents Corp. He is a director of the Lehigh Valley Railroad, the Farm Foundation and is chairman of the board of the Foundation for American Agriculture. He recently resigned as U.S. Assistant Secretary of Agriculture to accept a Professorship of Agricultural Industry in the Graduate School of Business Administration at Cornell University, Ithaca, N. Y.

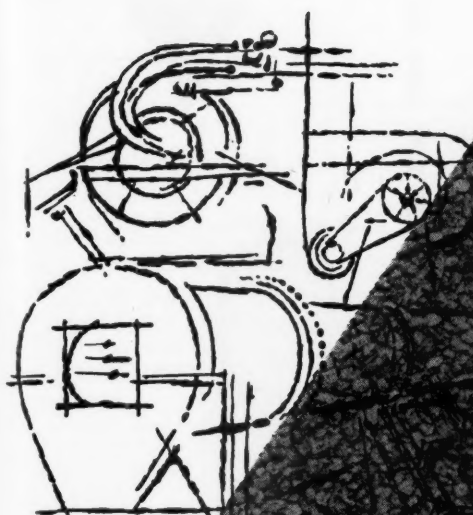


McConnell

Davison Chemical Co., Div. of W. R. Grace & Co. has appointed Edward J. Bierberich plant superintendent of its new desiccant manufacturing plant at Gallup, New Mexico.

Diamond Alkali Co. Dr. John H. Wotiz, since 1954 associate professor of organic chemistry at the University of Pittsburgh, has been appointed group leader in Diamond's Exploratory Research Dept. at Painesville, O.

Diamond Black Leaf Co. sales appointments: Norman D. Thomsen as staff assistant to commercial sales, Cleveland; Edward R. Luoma and Wayne H. Town as salesmen, with headquarters at Des Moines, Iowa; Harold A. Branson, sales supervisor, Richmond, Va.



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Here is a **DUAL PURPOSE**, coarse grade muriate of potash. Designed primarily for use in granulation.

It gives a higher yield of on-size product. It is also ideal for direct application and for the manufacture of top dresser goods.

National Potash standard grade muriate is designed to fit the needs of conventional fertilizers. Processed for a dust-free, non-caking muriate.



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MURIATE OF POTASH for the PLANT FOOD INDUSTRY

THIS symbol stands for high-grade coarse and uniform Muriate of Potash (60% K_2O minimum). Southwest Potash Corporation provides a dependable supply of HIGH-K* Muriate for the plant food industry.

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Southwest Potash Corporation

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FARM CHEMICALS

People

E. I. duPont de Nemours & Co. New sales representative for



Munzenmaier

DuPont's nitrogen products in the Pacific Northwest is Lawrence J. Munzenmaier. His headquarters will be in Sacramento, Calif. A native of Chicago, Munzenmaier received a degree in agronomy and an M. A. degree in turfgrass management from Purdue University.

Emulsol Chemical Corp.

has named Sy Friedman to its sales staff as assistant to A. O. Raven, sales manager. Formerly with Stauffer Chemical Co., Friedman will now make his headquarters at Emulsol's general sales office in Chicago.



Friedman

FMC Organic Chemicals Div. S. W. Jones, Jr. joins the Development Dept. as manager of plastics development. He had been with the M. W. Kellogg Co., Chemical Mfg. Div.

Hooker Electrochemical Co. has integrated the sales of Oldbury Products into the Hooker chemical sales department under

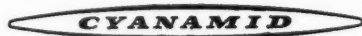
Boyd

Berggren



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new Triple Superphosphate.

The latest manufacturing
techniques have been designed
into our Brewster, Florida
plant... to bring you constantly
uniform, high grade Triple.
We're ready to ship *when* you
need it... *as* you need it!

Write, wire or phone for full
information. American Cyanamid
Company, Phosphates Department,
30 Rockefeller Plaza,
New York 20, N. Y.
...or Brewster, Florida.



John S. Coey, manager—eastern sales.

Robert B. Boyd, formerly sales manager, Oldbury Products, has been appointed product manager—organic chemicals. Fred H. Berggren, who had been assistant sales manager, Oldbury Products, is now supervisor—chlorate chemicals.

International Minerals & Chemical Corp. James P. Margeson, a director and executive vice president, retired June 30 after 17 years of service. His responsibilities are now handled by T. M. Ware, administrative vice president.

Promotion of two scientists in the Research Div. was announced by Dr. I. M. LeBaron, vice president in charge of research.

Dr. N. B. Gillis was named director of research succeeding Dr.



Gillis



Knopf

LeBaron, and Dr. William C. Knopf, Jr., was appointed assistant director of research, with broad responsibilities in all areas of the division.

Wilson & Geo. Meyer & Co. president, Wilson Meyer, has had conferred on him by the Future Farmers of America the Honorary Degree of State Farmer in recognition of his outstanding work for farm youth.

Nitro-Form Agricultural Chemical Co. Dr. Fred V. Grau, who joined the firm last October, has been named director and manager of university and college relations. In his new capacity, he will be responsible

for the outlay of funds to carry out the company's research work in various institutions.

Olin Mathieson Chemical Corp. Kenneth M. Baker is new publicity manager-chemicals, according to an announcement by Henry H. Hunter, director of public relations.

Olin Mathieson International Corp. Alfred T. Zodda has been appointed vice president—operations, responsible for all overseas operations of the corporation. He had been general manager of Squibb International Div., Olin Mathieson Chemical Corp.

Clement M. Brown Jr. has been appointed regional vice president-Europe for the firm. He will headquarter in Paris.

Stauffer Chemical Co. Martin L. Rice and Robert W. Rech have been named technical sales representatives for the Northeast Agricultural Chemicals Div. Rice will cover central and eastern Pennsylvania and the northern portion of the Shenandoah Valley from his headquarters in Gettysburg, Pa. Rech will represent the firm in Ohio, north of Columbus, and in several counties of western Pa.

U. S. Borax & Chemical Corp. Richard F. Steel has been appointed assistant general manager of the company, a newly created post. He is succeeded as treasurer of the company by Raymond C. Dosta, former assistant treasurer and as secretary by W. A. Ackerman, who had been assistant secretary.

Dr. Donald S. Taylor has been elected vice president in charge of research succeeding G. A. Connell, now retired.

Virginia-Carolina Chemical Corp. John L. French, C. H. Godfrey, R. Andrew Jenkins and



French



Godfrey



Jenkins



Waller

Raymond T. Waller have been named regional sales managers of V-C's Fertilizer Div. The new posts have been created in a reorganization of the company's fertilizer sales organization along regional lines.

Under the new set-up, V-C sales office managers, to be called district managers, will be under the direction of the four regional managers. These, in turn, will operate under Field Sales Manager Charles E. Workman and General Sales Manager A. P. Gates.

French moves to Albany, Ga., to become Southeastern regional sales managers; Jenkins, to Memphis as Southwestern regional manager; C. H. Godfrey to Cincinnati, Western; and Waller will operate out of Richmond as Eastern regional manager.

Zonolite Co. Robert P.



Arnold

Arnold, previously northern district sales manager for Terra-Lite products, has been named Terra-Lite sales manager. He will transfer from his home in Pittsburgh to Chicago, the general sales headquarters for the firm.

Millions of Tons...

TRIPLE SUPERPHOSPHATE



*Fine Texture, Small Particle Size
For Maximum Ammoniation-Granulation*

Millions of tons of high grade Triple Superphosphate have been produced in our large Tampa plants to supply many of the large and small fertilizer producers of this country, and, of course, many in foreign lands, with a Triple Superphosphate of highest dependability. We established, many years ago, high standards of product control through exacting chemical and physical analysis of every ton we produce. We have maintained these standards and have improved upon them as progress in chemical and mechanical science dictated. We are today producing Triple Superphosphate as fine as there is available. A product of very fine texture, small particle size that returns highest rate of ammoniation. A product that has received weeks of natural air curing to further enhance its chemical composition, and each batch has been pre-shipping conditioned to permit immediate inclusion into your processing.

RIGID QUALITY CONTROL
Through Six Basic Chemical and Physical Analysis

HIGH WATER SOLUBILITY
High Water Solubility is a Characteristic of all 3 Grades

RUN-OF-PILE
Fine Texture, Highest Porosity, Large Surface Area, Small Particle Size, for Maximum Ammoniation-Granulation.

GRANULAR
Dust Free, Free Flowing, Uniform Particle Size, Medium Hardness, No Bridging Over, for Direct Soil Application.

COARSE
For Intermediate Ammoniation to Produce a Semi-Granular Product. Also Affords Excellent Compatible Mixing with Granular Potash, for Minimum Segregation, in Alkaline Grades.

There's a **BRADLEY & BAKER** office near you. Their representative would be pleased to consult with you on your requirements and to advise on your most convenient delivery routings.

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Division
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Norfolk, Va.

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SIMMS LEAVES USDA TO TEACH IN TURKEY

Dr. Bennett T. Simms, widely recognized scientist in the fields of veterinary medicine and livestock research, retired from USDA on June 30.

Soon after his retirement, Dr. Simms planned to join the staff of

the University of Nebraska for assignment to the Veterinary College of Ankara University in Ankara, Turkey, under the International Cooperation Administration program. He has accepted a teaching and research position at the college in Turkey.

INDUSTRIAL USES FOR FARM PRODUCTS REPORT

The need for a dynamic and imaginative approach to farm-product utilization as a way of solving problems of farm surplus

is emphasized throughout the final report made to Congress in June by the President's Commission on Increased Industrial Use of Agricultural Products.

The group set out to find answers to the question: Can industrial markets absorb enough excess farm production to minimize—or possibly even eliminate—costly restrictions, supports and surplus-disposal operations?

Here is the conclusion, spelled out in the final report: "The Commission believes the answer is an emphatic yes, provided the necessary steps are taken to make possible and encourage such a development."

These necessary steps are presented in the report as the Commission's recommendations: (1) Increase participation by public and private institutions in an effective research network. (2) Greatly expand basic research on use of farm products. (3) Increase use of grants, fellowships and scholarships to increase the Nation's supply of scientists. (4) Place more emphasis on government-industry sharing of research costs. (5) Expand research and development work with new crops. (6) Make wider use of commercial-scale trials of new products. (7) Offer economic incentives to growers and processors to bridge the gap between research and established industrial uses of crops.

MOSQUITOES, HOUSE FLIES LEAD HOUSEHOLDERS' UNPOPULARITY POLL

About three-fourths of the 33 states reporting in a recent USDA study listed mosquitoes and house flies among the most important household insects of 1956. Termites and other wood-attacking insects, fabric pests—especially carpet beetles and clothes moths—and cockroaches cropped up as highly annoying pests in more than half the state lists.

Several insects that normally live out of doors got into enough homes last year to become serious problems. Clover mites were among the top 10 household pests in 11 states, boxelder bugs in five, and earwigs in five. Pests of stored

(Continued on page 19)



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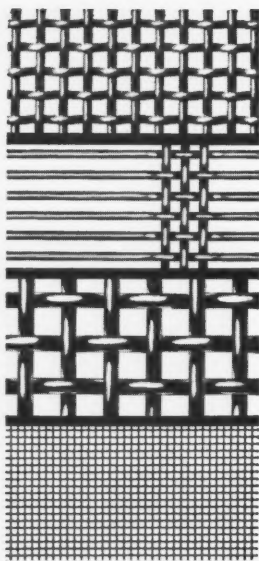
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(Continued from page 18)

foods and grains also ranked high on unwanted-guest lists.

Regardless of how often they turn up at picnics, ants were listed by only eight states as a top household insect problem. Only three states named fleas and chiggers.

Horn flies were a No. 1 pest of farm animals in 16 states. Cattle grubs were named in 14 state lists, cattle lice in 14 and stable flies in 12.

Ticks were harassing in seven states. Biting flies, pests of both man and beast, were also high on the list of livestock pests.

DR. COOPER RETIRED FROM CLEMSON COLLEGE

Dr. Herbert Press Cooper, professor of agronomy at Clemson College, and internationally-known soil scientist, recently ended 27 years of Clemson service.

Dr. Cooper formerly served as Clemson College dean of agriculture and director of the South Carolina Experiment Station.

NIAA ELECTS SICKLER AS BOARD CHAIRMAN

R. C. Sickler, product group manager, Advertising Dept., E. I. duPont de Nemours & Co., was elected chairman of the board of the National Industrial Advertisers Association in June at the association's 35th annual conference in New York.

Newly named vice-chairman is R. C. Myers, director of market development, U.S. Steel Corp.

Morse Truitt Ahlgren Coleman McDougall



AUGUST, 1957

FARM CHEMICALS

Associations & Meetings

NPFI NAMES COMMITTEE TO STUDY DUES STRUCTURE

Appointment of a 5-man committee "to evaluate the dues structure of the National Plant Food Institute to determine whether there are any inequities" was announced by John A. Miller, president. The committee will report its findings to the board of directors at a meeting scheduled for October 30.

Members of the committee are William E. McGuirk, Jr., president, Davison Chemical Co., Div. of W. R. Grace & Co., chairman; B. W. Bellinger, executive vice president, Tennessee Corp.; J. C. Crissey, division manager, G. L. F. Soil Building Service; Hugo Riemer, president, Nitrogen Div., Allied Chemical & Dye Corp.; and Richard C. Wells, president, National Potash Co.

The committee will consider any differences in views regarding

the dues structure as approved by the board of directors. Because of the importance of the study, an official report of findings will not be available until after the board meeting is held.

CYCLOHEXANE SUBJECT OF NEW MCA SAFETY SHEET

Latest addition to the Manufacturing Chemists' Association's series of safety data sheets, on cyclohexane, has just been published.

The booklet gives properties and essential information for the safe handling and storage of cyclohexane, including material on shipping containers, engineering control of hazards, waste disposal, medical management and employee safety.

Copies of Chemical Safety Data Sheet SD-68, Cyclohexane, are available from MCA, 1625 Eye St., N. W., Washington 6, D. C. at 30 cents each.

NPFI LUNCHEON FOR AG LEADERS

Plant Food Institute's executive vice presidents following a luncheon in Washington, D. C., June 14.

The Institute annually sponsors a luncheon for the officers and directors of the National Association of County Agricultural Agents when the group meets in Washington. Under Secretary of Agriculture Morse was the speaker at this year's luncheon.

Left to right in the accompanying photo are Morse; Paul T. Truitt, NPFI executive vice president; Dr. H. L. Ahlgren, chairman, Extension Committee on Organization and Policy, American Assn. of Land-Grant Colleges and State Universities and director, Extension Service, University of Wisconsin; Dr. Russell Coleman, NPFI executive vice president; and R. H. McDougall, NACAA president.

NO. CENTRAL WEED CONTROL CONF. TO BE LARGEST EVER

The North Central Weed Control Conference expects its fourteenth annual meeting and exhibit at Veterans Memorial Auditorium in Des Moines Dec. 10-12, 1957, to be the largest and most successful in the organization's history.

Plans for the event were announced by Assistant State Secretary of Agriculture Loyd Van Patten, Des Moines, exhibit chairman; and Dr. E. P. Sylwester of Iowa State College, Ames, who is chairman of local arrangements.

Approximately 150 exhibits of weed control chemicals and equipment, including new products and machinery, will be displayed in the main arena of the Auditorium from 8 a.m. to 5 p.m. daily. Exhibitor companies will have experts on hand to answer technical questions and demonstrate equipment.

All exhibits, demonstrations and meetings of the three-day event will be held at the Auditorium except the banquet, which will be held at Hotel Savery on the evening of Tuesday, Dec. 10.

Nationally-known authorities on weed and brush control will give talks and demonstrations on various phases of the problem. Sectional programs each morning and afternoon will cover weed control in industrial areas, field crops, pasture lands, turf and aquatic areas, and horticultural crops. Extension and regulatory activities in weed control also will be discussed.

Conference officers are L. A. Derscheid of South Dakota State College, Brookings; chairman; F. W. Slife of Urbana, Ill., president; and Dwight Lambert of Lincoln, Neb., secretary-treasurer.

Program committeemen are: Research, E. K. Alban of Ohio State University, Columbus; extension, John D. Furrer of the University of Nebraska, Lincoln; and regulatory, Howard Richards of Madison, Wis., state weed supervisor.

PORTLAND SITE OF 8th REGIONAL FERT. CONF.

More than 200 agronomists, prime producers and fertilizer manufacturers were in attendance at the Eighth Regional Fertilizer Conference in Portland, Ore., June 26-28. The conference is annually sponsored by the Pacific Northwest Plant Food Association.

Morning sessions were devoted to technical papers and discussions. On June 26, over 100 persons went on a tour trip to the Clackamas county, Ore., experiment station and the Clarke county, Wash., experiment station. The following day the group inspected the Oregon Grasslands Demonstration project sponsored by the association, and attended the annual banquet.

Pocatello, Idaho was selected for next year's conference, which will be held either in late June or early July.

WILSON PARTICIPATES IN FARM-CITY WEEK

Glenn Sample, chairman of Farm-City Week for 1957, has named Louis H. Wilson, secretary and director of information of the National Plant Food Institute, as chairman of the National Participation Development Committee for the event to be observed Nov. 22-28.

Farm-City Week is designed to foster a better understanding between farmers, industrial workers and business men. NPFI has supported it since its inception in 1955.

AAPCO PUBLICATIONS

The Association of American Pesticide Control Officials has announced that it has the following publications available:

1955 Edition, 191 pp. \$3.00. Containing monographs for 162 chemicals used as pesticides, it gives information on common names, chemical and physical properties, toxicity data, uses, formulations and handling. Also included is a roster of officers, committees, investigators, state control officials, agricultural pesticide regulatory personnel and secretaries of associated agencies. Regulatory principles, definitions

of terms and a summary of pesticide laws are also given.

1956 Supplement, 69 pp. \$1.50. Describes 26 additional chemicals and makes revisions in other sections.

1957 Supplement, 82 pp. \$1.50. Outlines data on 15 new chemicals and brings up to date other sections.

Order from the Secretary, AAPCO, Box HH, University Post Office, College Park, Md.

RICHFIELD JOINS MCA

New member of the Manufacturing Chemists' Association is the Richfield Oil Corp., Los Angeles, California.

PROGRAM COMPLETED FOR NSC FERT SECTION

The program for the 1957 Fertilizer Section of the National Safety Congress recently was released by J. Lauren Shopen, public relations chairman. Sessions will be held Monday and Tuesday Oct. 21 and 22, in Chicago.

Following election of 1957-58 officers on Monday, Frank A. Gerard, Olin Mathieson Chemical Corp., will talk on "Front Office Safety;" John H. Foulger, DuPont, on "Safety—A Retreat or a Challenge;" and James Kavanaugh, Travelers Insurance Co., will tell "How We Can Profit From Thorough Accident Investigation."

Tuesday's agenda includes a luncheon address by T. J. Clarke, Cooperative G. L. F. Exchange, Inc., on "The Man Who Wasn't There;" "Visualizing Ammonia Hazards," by E. V. Anderson, Johnson and Higgins; "Using Acids and Nitrogen Solutions Without Hazard—Carelessness Can Be Costly," by Elmer Perrine, Nitrogen Div., Allied Chemical & Dye Corp.; and "Observations on Latin American Safety," by A. B. Pettit, W. R. Grace & Co.

NATA '57 CONVENTION DATES ANNOUNCED

Galen Bertram, National Aviation Trades Association president, has announced that the group's 18th annual convention will be held at the Hotel Adolphus in Dallas, Tex., Nov. 13, 14 and 15.

CALENDAR

Aug. 13-14. Ohio Pesticide Institute Annual Summer Meeting, Ohio Agr. Experiment Station, Wooster.

Aug. 14. Conn. Agr. Experiment Station Field Day, Mt. Carmel, Conn.

Aug. 28-31. Soil Conservation Society of America Annual Convention, Asilomar, Calif.

Sept. 4-6. Annual Meeting, National Agricultural Chemicals Assn., Essex & Sussex, Spring Lake, N. J.

Sept. 5-6. Great Lakes States Anhydrous Ammonia Meeting, Michigan State Univ., East Lansing, Mich.

Sept. 8-15. International Congress of Crop Protection, Hamburg, Germany.

Sept. 11-13. Florida Entomological Society Annual Meeting, San Juan Hotel, Orlando, Fla.

Sept. 24-25. New England Fertilizer Conference, Bald Peak Colony Club, Melvin Village, N. H.

Oct. 2-4. Annual Beltwide Cotton Mechanization Conference, Shreveport, La.

Oct. 3. New Jersey Fertilizer Conference, Rutgers University, New Brunswick, N. J.

Oct. 3-5. Pacific Northwest Plant Food Assn. Annual Convention, Sun Valley, Idaho.

Oct. 7-8. Western Agricultural Chemicals Assn. Fall Meeting, Villa Hotel, San Mateo, Calif.

Oct. 14. Sixth Annual Sales Clinic, Salesmen's Association of the American Chemical Industry, Hotel Roosevelt, New York City.

Oct. 17. Conference on Chemical Control Procedures, Shoreham Hotel, Washington, D. C. Sponsored by the National Plant Food Institute.

Oct. 17. (8 p.m. States Relations Committee) & **18.** The Assn. of American Fertilizer Control Officials, Shoreham Hotel, Washington, D. C.

Oct. 29-31. Entomological Society of Canada and Entomological Society of Alberta Annual Meetings, Lethbridge, Alb.

Oct. 31-Nov. 1. Southern Fertilizer and Southern Soil Fertility Conference, Dinkler Plaza Hotel, Atlanta, Ga.

Nov. 3-5. 34th Annual Convention, California Fertilizer Association, St. Francis Hotel, San Francisco.

Nov. 6-8. Fertilizer Industry Round Table, Sheraton Park Hotel, Washington, D. C.

Nov. 17-19. Annual Convention, National Fertilizer Solutions Assn., Netherland-Hilton Hotel, Cincinnati, Ohio.

Dec. 2-5. Fifth Annual Meeting, Entomological Society of America, Hotel Peabody, Memphis, Tenn.

Dec. 11-13. Agricultural Ammonia Institute Annual Meeting, Hotel Marion, Little Rock, Arkansas.



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JOHN DEERE NITROGEN SOLUTIONS

Let a qualified **JOHN DEERE** technical representative show you how to save money and at the same time improve the physical condition of your fertilizer by using **JOHN DEERE Urea-Ammonia Solutions** . . .

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SO. CONTROL OFFICIALS CONVENED IN JUNE

The Association of Southern Feed and Fertilizer Control Officials held its Fifteenth Annual Convention at the Dinkler-Tutwiler Hotel, Birmingham, Alabama, June 17-19, 1957. Thirty-nine members of the association and 36 persons from industry were in attendance.

In addition to a very interesting program, the association held informal discussions on subjects pertaining to the control of feeds, fertilizers and pesticides.

New ASFFCO officers for the coming year are Dr. E. W. Constable, state chemist of the Department of Agriculture at Raleigh, North Carolina, president; Bruce Cloaninger, director, Department of Feed and Fertilizer Inspection and Analysis, Clemson, South Carolina, vice president; and Bruce Poundstone, head of Department of Feed and Fertilizer, Lexington, Kentucky, secretary-treasurer.

In addition to the above officers, the outgoing president, R. W. Ludwick of State College, New Mexico, Maurice Rowe, Richmond, Virginia, L. C. Jacobs, Nashville, Tennessee, Frank Fudge, College Station, Texas, and F. S. Carr of Atlanta, Georgia, comprise the Executive Committee.

Next year's meeting is scheduled for June, 1958, in Atlanta, Georgia.

CAL FERTILIZER ESSAY WINNER ANNOUNCED

Winner of the \$100 cash Grand Award in the 1957 California Fertilizer Essay Contest is James Burns, a student of vocational agriculture at the C. W. Pierce Junior College, Canoga Park. Sponsor of the annual contest is the Soil Improvement Committee of the California Fertilizer Association.

Purpose of the contest is to acquaint students in agricul-

tural courses with the value to agriculture of the proper use of commercial fertilizers. Papers are judged on coverage of the subject, extent of research into source material and composition.

A cash prize of \$25 is being sent to the author of the essay judged best from those submitted from each other school participating in the contest.

KING-SIZED SAFETY POSTERS PREPARED

A new batch of king-sized posters—the "biggest things in safety"—have been prepared by the National Safety Council. They are described in a new flyer that contains examples of the most recently prepared posters and an order blank.

Designed for use on billboards, the multi-colored posters are treated to resist weather. Different ones are available for each month of the year.

Individual copies of the flyer may be obtained from the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

NEW ENGLAND FERT. CONF. TO BE HELD SEPT. 25

The annual New England Fertilizer Conference, conducted under the auspices of the National Plant Food Institute, will be held at the Bald Peak Colony Club, Melvin Village, New Hampshire, on September 25, 1957, Dr. Russell Coleman executive vice president of the Institute, announced recently.

The conference which usually brings together representatives of the New England fertilizer industry and New England colleges of agriculture, will be open to members of the Institute and invited guests.

Registration will begin on the evening of September 24 and sessions will begin at 10:00 a.m., on September 25, concluding at about 3:00 p.m.

Walter E. Meeken and Edward R. Jones, members of the Institute's Board of Directors, head a committee on arrangements for the conference.

The sessions will be built around the factors which influence New England farmers' fertilizer-using practices. The basis for the dis-

cussion will be a study on this subject now being conducted by National Analysts, Inc., of Philadelphia for the Institute.

The section of the study which deals with fertilizer practices of farmers in the Northeastern part of the United States will be discussed in detail by leaders from New England colleges of agriculture and the New England fertilizer industry. Presiding over the sessions will be Dr. Mason H. Campbell, Dean of the College of Agriculture and Director of Experiment Stations at the University of Rhode Island.

NPFI said that members of the industry planning to attend should make their reservations with the Bald Peak Colony Club, stating their company affiliation in the reservation request.

LOWELL BRANDNER WINS AG COMMUNICATIONS AWARD

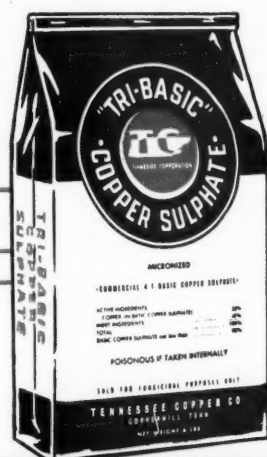
Lowell Brandner, agricultural editor, Kansas State College at Manhattan, was announced as the winner of the American Association of Agricultural College Editors-National Plant Food Institute "Agricultural Communications Award" at a special dinner ceremony July 16 at Colorado State University.

Announcement of the award was made by Samuel H. Reck, editor, Extension Service, College of Agriculture, Rutgers University, president of AAACE, which is holding its 41th annual convention at Colorado State.

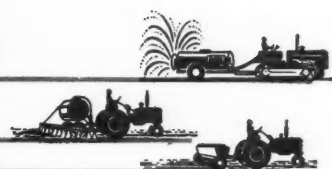
Louis H. Wilson, secretary and director of information for the Institute, presented to Lisle Longsdorf, Kansas State College extension editor, on behalf of Mr. Brandner, a scroll signed by the national judges, together with a check for \$500 to be used for advanced professional training in agricultural communications.

KY. FERTILIZER CONF. SCHEDULED FOR SEPT.

Bruce Poundstone, head of the Dept. of Feed and Fertilizer of the University of Kentucky, reports that the annual Kentucky Fertilizer Conference will be held at 10:00 a.m. (CDT) Sept. 4 at the Campbell House, Lexington.



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Longer Protection

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Upgrades Quality of Fruits & Vegetables

Longer Shelf Life

Corrects Copper Deficiencies

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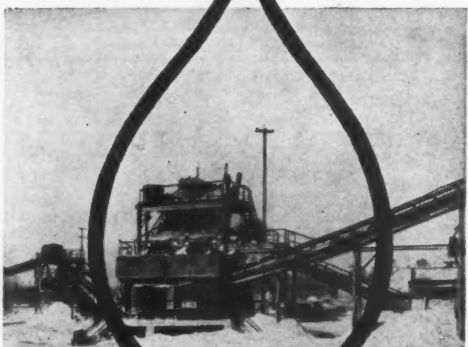
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FARM CHEMICALS

Associations & Meetings

FIRST PRIZE GOES TO PLANT FOOD REVIEW

Plant Food Review, the National Plant Food Institute's quarterly magazine, has received a first award in the annual Middle Atlantic Association of Industrial Editors' publications contest. The *Review* was entered in the division for "external" magazines.

Delbert L. Rucker, editor, accepted the award. He also was elected president of MAAIE for the coming year and will hold this office until June, 1958.

FERT SAFETY SECTION EXECUTIVE MEETING

Nineteen members attended the recent Mid-Year meeting of the Executive Committee, Fertilizer Section of the National Safety Council in Richmond, Va., reports J. Lauren Shopen.

The meeting was held in the board room of the Southern States Cooperative Building, with E. O. Burroughs, Jr., of F. S. Royster Guano Co., as chairman.

The Engineering Committee reported it is preparing material for use in the form of safety instruction cards, covering valve check operations, conveyor belt operation, sewing, mixer operation, tractors, blasting, superphosphate den operation, acid concentration and triple mixing.

FIRST AOAC-WILEY AWARD WON BY L. C. MITCHELL

Lloyd C. Mitchell, research chemist of the Food and Drug Administration, has been selected to receive the annual Harvey W. Wiley Award of the Association of Official Agricultural Chemists. He is the first winner of the award, which was established last year to honor the father of the original Pure Food and Drug Law. Consisting of \$500 in cash, the award goes to the scientist who makes an outstanding contribution to the development of methods for the analysis of foods, drugs, cosmetics, feeds, fertilizers, pesticides and soils, or for use in general analytical chemistry.



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VIEWING WASHINGTON

with Farm Chemicals
Washington Bureau

on agriculture

Another attempt to ban federal payments for conservation practices employing lime and fertilizer has been successfully beaten off by the Congress. The result is that the 1958 Agricultural Conservation Program will continue essentially the same as this year's operation.

Here's what happened: Assistant Secretary Ervin Peterson, in a memorandum to ACP Chief Paul Koger, ordered 9 specific ACP practices eliminated from the 1958 program. This included the A-4 practice which pays, principally, 50 per cent of the cost of liming the soil, as well as for use of some fertilizer. This practice alone pays more than \$30 million a year for liming--a major incentive for farmers to use lime.

Other practices which would have been dropped include initial treatment of land to permit the use of legumes and grasses, initial establishment of a permanent vegetative cover in orchards and vineyards, establishment of additional acreage in vegetative cover in crop rotation.

The memorandum was slipped to ACP "friends" on the Hill at the 11th hour. Congress got it in time to add an order to the final version of the USDA money bill to the effect that the 1958 program should be continued as-is. The order stated that USDA officials told Congress early this year that the program would not be changed. One of the prime-movers on the order was Rep. Jamie Whitten, chairman of the House Appropriations subcommittee on agriculture. Whitten told us he expects the USDA to keep its earlier promise.

It should be noted, however, that ACP is not out of danger. Secretary Benson twice before tried to cut out lime and fertilizer practices, in 1953 and again in 1954. Each time Congress over-rode him. There's no doubt the effort will continue--and may succeed after 1958. Total amount available for all practices each year is \$250 million.

Farm production this year now is officially forecast as the smallest since 1951--almost six per cent less than last year's record total output. Chances are, however, that the outlook will improve--provided favorable weather predominates. The plentiful moisture now available, which served to slow progress this spring, could bring on higher yields than the Agriculture Department now anticipates.

Total land in cultivation for 59 major crops is 333 million. This is only 13 million acres less than last year--although farmers have pledged 28 million acres to the Soil Bank. This indicates the size of the shift from cotton, corn and wheat land to the other feed grains and soybeans.

Corn acreage in cultivation is reported at 73.6 million acres, 5 million below 1956. The cut is due to the Soil Bank abnormally wet fields at normal planting time in many areas, plus a trend toward lower acreage in most sections outside the main Corn Belt. Figuring on an average yield

VIEWING WASHINGTON

agriculture Continued

of 42 bushels per acre, the crop looks to be 3 billion bushels, down a half billion from 1956.

Wheat acreage is estimated at 43.2 million acres, 7 million less than last year and the smallest since 1904. The cut is due primarily to drought last fall and winter and floods in major areas this spring, plus the Soil Bank. Total crop is estimated at 940 million bushels, 57 million less than 1956.

Tobacco acreage for all types is estimated at 1.1 million acres, 17 per cent below last year and the smallest since 1908. Two reasons given for the sharp cut are the heavy cuts made in acre allotments for many types, plus 80,000 acres signed into the Soil Bank.

The 1958 Soil Bank now is expected to have much less effect on production than the limited success of this year.

Actions by both Congress and the USDA will render the program almost useless, in the opinion of some officials here. In passing the USDA money bill, Congress put a limit of \$3,000 on individual payments under the acreage reserve in 1958. This is expected to keep millions of acres from larger farms out of the program. Some payments this year go as high as a half million dollars.

Secretary Benson, meanwhile, has announced intentions to impose a so-called Soil Bank base acreage regulation on the 1958 program. Every farmer who enters either or both the acreage and conservation reserves of the Bank will receive a "base" for soil-depleting crops. This will be the average of the land a farmer had in these crops during the past 3 years. In order to get Soil Bank money, the farmer cannot increase his acreage above the base. This limitation is likely to keep additional millions of acres out of the 1958 Bank.

Food & Drug Administration has approved the use of the pesticide toxaphene for use against parasites on beef cattle, sheep and goats. It has not been approved for use on dairy cattle.

Residue tolerance of 7 ppm has been established for traces of the chemical in the meat fat. Toxaphene may be sprayed on livestock, but all spraying must be halted four months before slaughter.

A federal "clean corn" campaign now is in the official talk stage—following the launching of the "clean wheat" program. Details of the new program, which won't get off the ground before the summer of 1958, have not been worked out, but it will be aimed at keeping rat pellets, insect-damaged kernels and other filth out of the corn supply used for food. This program may stimulate new interest in insecticides used for stored grains.

Rail freight rates are in for another round of increases late this summer or early fall, unless the Interstate Commerce Commission changes its usual course.

Arthur Sanders, Executive Secretary
Scale Manufacturers Association, Inc.

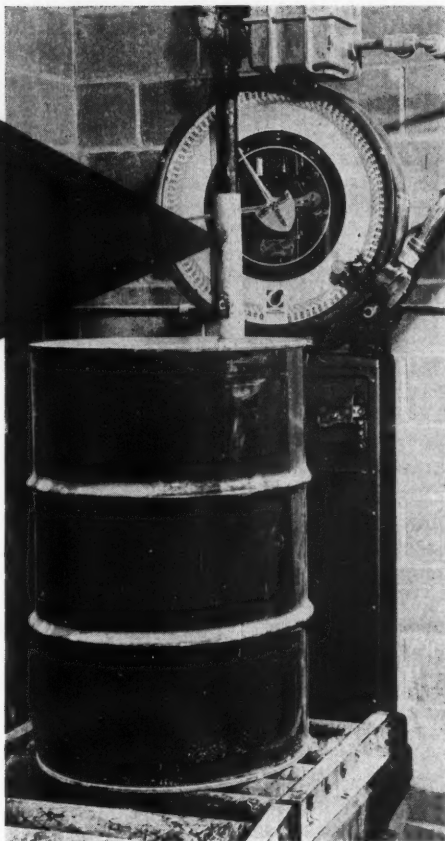
Accurate Weighing— Key to More Profit

THIS past spring, the Wisconsin Weights and Measures Department, in cooperation with city sealers throughout the Badger State, completed a survey on one of the most important industries serving Wisconsin agriculture—the commercial fertilizer industry.

The weights and measures officials tested all the scales used at each Wisconsin fertilizer plant and checkweighed representative quantities of the bagged fertilizer on hand ready for shipment.

The results left a great deal to be desired in the way of weighing accuracy, officials stated. As to the accuracy of the scales tested, 42 per cent were condemned as having performance errors beyond the 1/10 of 1 per cent, plus or minus, allowed tolerance. In checkweighing the output the officials found that on the whole the bags checked at all plants made a fair average, a little short of full weight, but not bad on the average.

Actually, though, the officials were not satisfied with that situation at some plants, those with the most unsatisfactory scales, where bags of fertilizer marked "80 pounds net" which varied in actual weight from as little as 71¾ pounds to as high as 88¾ pounds. To any weights and measures official, a 10 per cent error is tremendous, whether it be over or under, and the situation calls for prompt remedial action.



Also, the Wisconsin officials were not satisfied with the "average" shortweight situation for another reason. Even though it was small, it still amounted to some 1,425 tons of fertilizer with a value of about \$85,500. Everyone knows, too, that averages on a broad statewide survey may not be too meaningful. One plant may be losing its shirt on overweights from bad scales, while another is profiting, unintentionally, from shortweights.

The results of the survey did confirm what weights and measures officials, executives of the fertilizer industry, and scale industry executives have long known—that no operation of the commercial fertilizer industry is more significant to its continued good will and profit stability than accurate weighing.

Certain conclusions reached by the Wisconsin officials were: the accuracy of the mechanical weigh-

1. A good scale is a precision instrument—handle it with reasonable care.
2. Dust and corrosion can gum up the works—literally—and build up friction in your scales. Keep your scales clean.
3. Use care in placing loads on scales—to avoid misalignment.
4. Replace scales which inspections show consistently unreliable. Regular replacement protects you from having your scales give away your money.
5. Don't overload scales beyond their capacity. That can often permanently harm them.
6. Scales can get out of adjustment, just like other pieces of machinery. Regular inspection and repair can save you money and headaches. REMEMBER, your scale can give away literally thousands of dollars worth of your product if they aren't working right.
7. Consult your local scale representatives about new developments in weighing. Modern methods can make your plant more efficient.

ing equipment should be improved, even under the adverse corrosive conditions under which they operate; the industry as a whole, and particularly some companies, must give higher priority to weighing practices as well as scales, so that full net weight will result on averages of both small and large lots, with only small variations per bag.

What is true in Wisconsin with regard to scale errors in bagging fertilizer is undoubtedly true—even more so!—elsewhere. For Wisconsin has one of the most progressive weights and measures departments in the entire United States, and scales and weighing procedures there are undoubtedly considerably better than over the nation as a whole.

The farm chemical industry, intensely competitive, with a traditionally low margin of profit, hardly needs to be alerted to an interest in plugging every possible profit leak. Yet, there is one source of profit losses—weighing mistakes—which is often overlooked.

FERTILIZER WEIGHING BAD

In talking with scale industry executives and reviewing the special problems of fertilizer weighing with them, one colorful comment I heard repeated, in substance, over and over again was "Possibly some of the worst weighing in the country is at fertilizer plants. This is partly due to the fact that the material is so corrosive that scales soon deteriorate, but, in addition, much of the industry all too often does not appreciate the large losses that weighing mistakes can bring. They tend to regard the product as inexpensive per pound and are, by and large, inclined to accept the scale as a device of continuing accuracy, which can do no wrong."

This is to suggest that with proper weighing equipment and with proper weighing procedures, speed and accuracy are both possible. With weights and measures officials bound to become more active in

the farm chemical field in the future, this is certain to become an inevitable trend of the future.

WEIGHING UNDER DIFFICULT CONDITIONS

The problem is also complicated by the fact that conditions under which weighing must be done in the farm chemical field are usually difficult. Dust, which gets into the moving parts of the scale, corrosive materials, the necessity for high-speed weighing—these complicate weighing in your industry. But, of course, these can be overcome with modern equipment, provided it is operated by persons who understand the need for accurate weighing, and provided that the equipment is given proper maintenance and reasonable care.

ARE SCALE ERRORS IMPORTANT?

Are scale errors important? Especially in a comparatively heavy product like farm chemicals? Take the word of George L. Johnson, Kentucky Director of Weights and Measures, they are. In 1956 his Division of the state government began a campaign to inspect bagged fertilizer and feed weights. They found over \$1,500,000 of short weights alone. In view of the low value per pound of the material, they did not condemn overweights, but they did require all lots found to be underweight on the average to be returned to the producer and rebagged.

Think of the cost of reshipping, re-weighing, refilling and resacking fertilizer and feed, the short-weight of which was valued at \$1,500,000. That would be a terrific undertaking and extremely costly. Certainly, it would take away any possibility of profit. In fact, the rehandling of the bagged material would cost far more than the normally expected reasonable profit. Actually, in a situation such as that in Kentucky, where tremendous quantities were condemned, no producer of these materials would wish to have overweights returned for rehandling. Naturally, the rehandling would cost far more than the returned excess material, which might average 1 per cent to 3 per cent.

But, to avoid giving the impression that all fertilizer inspections show shortweights, let's see what the Virginia Supervisor of Weights and Measures, Thomas C. Harris, Jr., said in his 1955 annual report. He cited the data on checkweighing 283 lots of fertilizer containing 49,167 bags. He ordered "off sale" 139 lots (49 per cent of the total checkweighed), until rebagged and brought up to proper weight. On the other hand, his inspectors found 141 lots (50 per cent of the total) to be overweight, but these were not condemned because of the relatively low return savings to the producer as compared to the handling cost. Only 3 lots, less than 1 per cent, were found to be "correct" within the allowed weight tolerance.

To simplify, suppose we put the cost of weighing errors in elementary arithmetic. Take the case of a plant which turns out 25,000 tons of fertilizer annually and we suppose its cost, put in the bag, is 2 cents a pound. If the bags average 1 pound per hundred overweight, those materials alone have cost \$10,000. This case is simple, but the essentials are there to show what can happen if your scales are

allowing overweights. And, although there are many uncontrollable costs and losses in producing farm chemicals, scale weights are not among them. At relatively low cost, you can have accurate and dependable weights which will insure your expected profits, and will avoid unintended embarrassment from weights and measures condemnations.

With weights, it comes down to a simple proposition. Weight determinations must be *exactly* right—or rather they must be very reasonably close to the declared net weight—on the average of each lot (the new scales you use are required to perform within 1/10 of 1 per cent of the load put on the platform). Otherwise, you are either giving away money (if you give overweight) or you are stealing money, however unintentionally, if you give underweight. This latter course is likely to lead to trouble with weights and measures inspectors and a consequent loss of good will from dealers and customers.

WEIGHING AND QUALITY CONTROL

Quality control comes natural in the farm chemical industry where a bad batch may lose a lot of raw materials or a lot of customers. There is a premium on consistency—in the form of repeat customers.

Weight control in batching has long been recognized as the most dependable quantity measurement that can be used. In recent years the scale industry has provided quality control weighers and systems that are marvels of consistency, accuracy and dependability. To the extent desired, proportioning can be done automatically with complete records to show what was done. The batch formula can be set at a control panel and after that it operates mechanically. The system can even be triggered by punched cards with the formula punched in to supply the proper ingredients at the right time. No place there for our human mistakes.

Quality control with modern, dependable scales not only provides consistency in the execution of your proportioning formulas (and constant standard of product) but, with the elimination of the mistakes inherent in manual operations, it can avoid wasteful excesses in the portions. Not to be overlooked, also, are the savings in costly man-hours and machine-hours which can be had with automatic weighing and control systems. This is due to the greater speed which can be engineered into a weighing system which is to operate automatically, mechanically and continuously. Actually, it is called "automation" these days.

A LITTLE CARE PAYS BIG DIVIDENDS

A little care with your scales, plus some scale know-how can pay big dividends. Naturally, you are anxious to avoid errors. How can you do this? There are four things that will help:

1. Become "scale conscious." Be aware that scales are like any other piece of equipment. They can get out of whack, too.
2. Have your scales checked for accuracy frequently and give them reasonable care and maintenance.
3. Replace them after they've served out their useful life. Obsolete, worn-out scales are most prone to maladjustment and parts wear which can cause unknown errors.
4. Keep abreast of the new developments which have been and are being made to provide greater efficiency in your weighing, and therefore to safeguard your profit returns.

It will help if you become "scale conscious" and make sure that your employees do, too.

GOOD HOUSEKEEPING

AND SAFETY

W. A. Stone

Wilson & Toomer Fertilizer Company

WEBSTER defines housekeeping as "The state in which a house is kept." With this definition in mind, good housekeeping takes on an extensive meaning.

Good housekeeping is not a one person undertaking. If more than one person lives in that house it then becomes an individual responsibility for each member of that household. A house that is dependent on "Spring House Cleaning," for its orderliness could hardly be used as an example of good housekeeping. Every item in a house, whether it be furniture, dishes, clothing or garbage has its individual place and can only be there by the concentrated effort of all concerned.

For a good safety program two hazards must be eliminated, unsafe conditions and unsafe acts; therefore the first fundamental of safety is good house-

keeping. This does not mean a general cleanup at the end of the shipping season and the hurried, periodic cleanup by a crew of men the day before some of the top "Brass" is coming by on a plant visit; no it means the interest and concentrated effort on the part of each man in the plant, *daily*.

In the fertilizer plant we have two types of handling, bag and bulk. There are certain good housekeeping policies that go along with each. Bulk handling from cars should have a definite pattern from cars to storage and vice versa, keeping spillage cleaned up as we go along. Boards and dunnage should be cleared from the track. Bin walls should be secure to withstand the pressure of the type of pile we expect to store.

Storing bags should follow the recommended

pattern with piles not too straight up, with ends and sides bulkheaded. To avoid slides, broken bags should not be put in the pile because they continue to break and can cause piles to fall. These should be rebagged as the operation goes along. Broken bags and paper should be carried away and disposed of.

Aisles should be kept clear of all debris and wide enough for adequate work space. Piles should be kept back from fire and electrical equipment and this equipment should be properly marked.

When repairs are made, the job should not be considered complete until all worn parts have been re-

moved to a designated scrap pile.

Shops and maintenance buildings should be kept orderly; spilled oil and grease should not be left on the floor nor pieces of material that might be tripped over. Containers of gasoline and cleaning fluid should not be left open.

Good housekeeping has a direct relationship to safety. It eliminates the majority of the unsafe conditions and the high percentage of accidents that can be traced back to such conditions, but good housekeeping can only be achieved with the individual and combined efforts of all employees.

SAFETY WITH MOBILE PLANT EQUIPMENT

Grayson Morris
Southern States Co-operative, Inc.

TWENTY-FIVE years ago fertilizer plants were in the Georgia buggy era. A few storage battery dump trucks were in use in some plants and quite a few horses were employed to pull dump carts, but for the most part, fertilizer was transported throughout our plants by employees who supplied the muscle power. Of course, there were occasional accidents and some employees within our plants were injured, but nothing like as many as today with our modern mechanical means of inter-plant transportation. The reason is obvious. Compare the danger on the highway today with our modern, high speed, big horsepower cars to the situation back about 1930 when the maximum speed was about 40 miles an hour and cars were much fewer in number.

Transportation within our fertilizer plants has kept pace with the times. Today most of our transporting equipment is powered by gasoline motors, ideally suited for unloading bulk materials from box cars and transporting within the plant to elevators. In fact, today the efficient operation of any fertilizer plant depends on suitable mobile equipment. But just stop and think for a moment how many mobile tractors, pay loaders, tow motors and other pieces of equipment are constantly traveling through narrow alleys within your own plant . . . often at relatively high speeds. Conditions are so crowded that the passage ways through which this equipment must maneuver might be aptly compared to an obstacle course. For the most part, operators are on their own in maneuvering back and forth from bins to elevators. They do not have stop lights or traffic cops to direct them. And to make matters worse, in many cases the equipment is not in the best working order. Obviously a pedestrian in a fertilizer plant today is in constant danger of being hit; in fact, he is taking his life in his hands every time he walks through the plant. And, of course, there is always the added risk of a collision between two pieces of motorized equipment. What can we

do to lessen this danger and make our plants safer places in which to work?

Well, first of all let's start with the equipment itself. We can take measures to make certain it is in good working order at all times. This means regular inspection of brakes, horns, steering mechanism and the hydraulic system. If any equipment is faulty, it is our responsibility to see to it that it is fully repaired by an expert mechanic. What it boils down to then is an inspection program for our equipment somewhat similar to the one which we have for automobiles and trucks here in Virginia . . . a program which will greatly cut down on the number of accidents in our fertilizer plants due to mechanical failure. Once we have our equipment in top notch working order, we have taken a big step toward correcting accidents.

But this is only half the battle. A piece of motorized fertilizer equipment is no safer than the person who operates it. What type of operators are we using on our equipment? Have they been carefully trained to run our mobile tractors and pay loaders? Are they safety conscious—do they give the proper signals for left and right turns, blow horns at proper times and show reasonable courtesy toward other drivers? Are they constantly on the lookout for pedestrians? And above all, do they ever take needless chances?

Some of our operators handle their equipment like frustrated "hot rodders". They seem to want to see how fast they can operate the machines and how close they can come to the other fellow without hitting him. This is the kind of behavior that creates accidents. A "show off" has no business operating any piece of motorized equipment in our fertilizer plants. How can we get our drivers to practice good safety habits? Obviously a sound driver training program is needed with special emphasis placed on the importance of safety. I am sure that you have some good ideas as to how we can approach this problem of safety in our plants and lick it!

Arcadian® News

Volume 2

For Manufacturers of Mixed Fertilizers

Number 8

Crops need the SULPHUR in Ammoniated Superphosphate

MANY SOILS NEAR DANGER POINT OF SULPHUR DEFICIENCY

Analysis of the minerals in crop plants has always been useful in determining plant food needs. When scientists discovered that barely one fourth of the sulphur in a crop plant was recovered in the ash, they began to realize the vital importance of sulphur as a plant food.

Crops, on the average, remove about as much sulphur from the soil as they do phosphorus. Yet the average soil contains only half as much sulphur as phosphorus.

With the increase in use of sulphur-deficient triple superphosphate and ammonium phosphate in concentrated fertilizers, much land gets little sulphur. This secondary plant food element is more and more apt to limit crop yields and profits. Soils in the Southeast, the Pacific coast, the Intermountain areas, and in the northern Midwest have already shown signs of sulphur deficiency.

Rich Source of Sulphur

But the fertilizers you make with ammoniated superphosphate are a rich source of sulphur. Normal superphosphate contains more sulphur and more calcium than phosphorus. Since you charge your customers only for the guaranteed nitrogen, phosphoric acid and potash in mixed fertilizer, you are giving a bonus in calcium and sulphur for the mere cost of transportation.

Sulphur leaches out of the soil almost as fast as potash or calcium, and it needs

to be applied frequently. In an analysis of drainage water in the James river in Virginia, sulphuric acid made up 5¼% of the solids in the river water, while there was only a trace of phosphoric acid. A similar test of the Pecos river in Texas showed 44% of the solids in the water was sulphuric acid, and only a trace was phosphoric acid. A little sulphur comes back to the land in rain, in coal and oil burning or smelting areas. This amounts to only 5 to 30 pounds per acre.

Sulphur Increases Yields

Legumes, grass, cotton, tobacco, corn, and all plants in the cabbage, onion and mustard families require considerable sulphur for high yields. Sulphur also is needed for good nodule formation on legume roots. Symptoms of sulphur deficiency appear in many crops as pale green leaves, not to be confused with the drying up of older, lower leaves, typical in nitrogen deficiency.

With cotton, lack of sulphur reduces yield of seed cotton, number of bolls matured and rate of growth. In 12 Alabama tests on a wide range of soils, cotton response to sulphur showed an average increase of 161 pounds of seed cotton per acre.

In a three-year test on typical Southeastern soils, white clover produced poor yields when sulphur was omitted from the fertilizer. In an alfalfa test, yield was

1 ton per acre without sulphur, and 6½ tons per acre with 300 pounds of sulphur. With 600 pounds of gypsum or 820 pounds of superphosphate in fertilizer, yield was 8¼ tons per acre.

Officials Know Benefits

The growing concern over sulphur and other secondary and minor elements is aptly summarized by Dr. Howard T. Rogers, head of agronomy and soils work at Alabama Polytechnic Institute: "There is no doubt about the importance of calcium, magnesium and sulphur in fertilizers for Alabama crops and soils. As long as all mixed fertilizers sold in the state contain adequate amounts of these elements, their regulation will not be of serious concern. However, if sulphur-free mixtures are marketed in appreciable quantity, it would appear advisable to consider regulation and control of this element. . . . If complete fertilizers without sulphur, such as some of the nitric phosphates, are offered for sale (in Alabama) the Experiment Station will not recommend their use on cotton."

When you ammoniate superphosphate as a base for mixed fertilizers, you are giving farmers a big extra value in free sulphur and calcium essential to profitable crop production on many soils. It pays to tell your customers about these extra benefits.



**TONNAGE
OPPORTUNITIES**

Grass and trees are two big tonnage opportunities for development by the fertilizer industry.

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FERTILIZER MAKES GRASS GROW HIGH-PROTEIN FEED

More fertilizer is needed on grass pasture and haylands. Its use can bring big profits to farmers and to fertilizer manufacturers.

For example, most haylands produce only 1½ tons of low-protein feed per acre, and pastures even less. But many leading farmers now are using several hundred pounds of mixed fertilizer per acre. The result? Yields range up to 4 or 5 tons per acre of high-protein feed, and these farmers reap a sizable return on their fertilizer investment.

Outstanding Results

Wisconsin dairymen and farmers have achieved outstanding results by using 500 pounds of 10-10-10 per acre on mixed legume-grass and grass meadows. In 403 farm tests, this fertilizer brought, on the average, an extra 1½ tons of dry weight feed per acre, with total yield averaging more than 3 tons per acre. Unfertilized land ran just under 1½ tons of feed per acre. The extra feed produced by fertilizer was worth \$61 per acre more than the fertilizer cost.

Continuing New Jersey experiment station work is successfully producing high-protein, high-tonnage pasture and hay forage. Feeding tests show that well-fertilized, deep-rooted grasses produce about as much milk as alfalfa and higher daily weight gains of beef and mutton. Persistent stands of well-fertilized grass may replace alfalfa on millions of acres where alfalfa is expensive to grow and stands last only 3 years.

Yields of grass forage in 3½ years of New Jersey tests have averaged as high as 3½ to 4½ tons dry weight per acre, with protein content of 15 to 19%. Total digestible nutrients in the grass were approximately 64 to 68%, somewhat higher than alfalfa and equal to a good grain ration.

Need Balanced Fertilizer

The New Jersey grass plots all were fertilized with 500 pounds of 5-10-10 at seeding time. They also received the equivalent of 1,000 pounds of 10-10-10 each succeeding year, with additional nitrogen on the highest yielding plots. This practical level of fertilization produced 4 tons per acre of grass hay, con-

taining 1,230 pounds of protein, at a fertilizer cost of \$48 per acre. The home-grown protein cost only 4 cents per pound—far less than any protein supplement.

Balanced Growth

In mixed legume-grass seedings, many farmers like to use high-nitrogen fertilizer to keep up the grass content of the mixture to control bloat. Because grass is a better forager for potash than legumes, this may speed disappearance of legumes from the mixture. Balanced fer-

tilizer such as 10-10-10 supplies the potash to help legumes, as well as nitrogen to build big grass yields and high protein content.

Fall is an ideal time to fertilize pastures and haylands. Spreading is faster and easier on the firm soil. The fertilizer not only produces more feed, but also builds strong food reserves in the roots for earlier growth and earlier grazing in the spring. The more pasture and hayland fertilizer you sell to farmers this fall, the more profit you and your customers will make!

FOREST TREES ARE A BIG MARKET FOR FERTILIZERS

Trees respond to fertilizer just as other plants do. Farmers, paper and lumber companies, and state experiment stations are now conducting many tests to find out how well forest tree fertilization pays. Now is a good time to run some tests on tree feeding in your area, to prepare for this big potential market.

In another 50 years we will need twice our present production of 47 million board feet of lumber. Use of pulpwood has shown an enormous increase. And our growing population uses Christmas trees in increasing quantities each year.

490 Million Acres

We are now planting nearly a million acres of forest trees per year. But more than half of our 490 million acres of commercial forest land is in a poor state of productivity. Much of this land can produce more wood and more income faster with fertilizer.

Some of the tests of fertilization of forest trees are promising indeed. Tree nurseries have found that fertilizer improves the size and vitality of nursery stock. It also improves the survival and speed of growth of young trees used in forest planting.

Where fertilizer has been used on seed trees left in clear-cut forest land, the increase in seed production has been as high as 1,000 per cent. Fertilization

of partly grown trees also can save much labor in thinning and pruning. The quick growth with fertilizer kills out the lower limbs fast, and also enables larger trees to suppress smaller trees.

Forest soils in different areas vary widely in fertilizer needs. Some need potash, some need magnesium, some need phosphorus, and practically all need nitrogen.

Rapid growth of trees with fertilizer may be better for pulpwood and timber than for fine lumber production. But even Christmas trees benefit from fertilizer under the right conditions. On poor native soils, on eroded or worn out land, and on spoil banks left after strip mining, fertilizer can make a huge difference in tree growth.

Ground application of fertilizer is easy in nurseries and small, level woodlots. For large trees and for rough, hilly and mountainous country, aerial application of concentrated fertilizers is the only practical method.

Write for Information

Now is a good time to establish small acreage fertilization of forest trees and Christmas tree plantings in your marketing area. For information on forest fertilization, write to Nitrogen Division, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, N. Y.

NITROGEN *plus* SERVICE

There are many reasons why it pays you to deal with Nitrogen Division, Allied Chemical. You are served by America's leading producer of the most complete line of nitrogen products. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions for the fertilizer industry. You are assured of dependable supplies from three huge plants at Hopewell, Ironton, and

Omaha. Your nitrogen is delivered to you by the best transportation facilities and equipment. You get technical assistance and formulation advice from the largest and most efficient staff of nitrogen experts. Your sales are supported by the most powerful advertising campaign ever conducted to sell fertilizers. Nitrogen Division is your headquarters for **NITROGEN *plus* SERVICE**. Look over the big line and contact one of the 14 offices listed below.



Nitrogen Solutions

	CHEMICAL COMPOSITION %					PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water	Approx. Sp. Grav. at 60°F	Approx. Vap. Press. at 104°F per Sq. in. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA®								
2	41.0	22.2	65.0	—	12.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	1.147	18	26
3	41.0	26.3	55.5	—	18.2	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	1.188	1	56
4M	41.0	19.0	72.5	—	8.5	1.194	7	61
6	49.0	34.0	60.0	—	6.0	1.052	48	-52
7	45.0	25.3	69.2	—	5.5	1.134	22	1
URANA®								
10	44.4	24.5	56.0	10.0	9.5	1.108	22	-15
11	41.0	19.0	58.0	11.0	12.0	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	1.081	25	-7
13	49.0	33.0	45.1	13.0	8.9	1.033	51	-17
15	44.0	28.0	40.0	15.0	17.0	1.052	29	1
U-A-S®								
A	45.4	36.8	—	32.5	30.7	0.925	57	16
B	45.3	30.6	—	43.1	26.3	0.972	48	46
Anhydrous Ammonia	82.2	99.9	—	—	—	0.618	211	—

Other **ARCADIAN®** Nitrogen Products: **UREA 45 • A-N-L®** Nitrogen Fertilizer
Ammonium Nitrate • American Nitrate of Soda • Sulphate of Ammonia

NITROGEN DIVISION Allied Chemical & Dye Corporation

MAIN OFFICE: 40 Rector Street, New York 6, N. Y., Phone: Hanover 2-7300



Branch Offices

Hopewell, Va., P. O. Drawer 131 Cedar 9-6301
Ironton, Ohio, P. O. Box 98 Ironton 8-4366
Omaha 7, Neb., P. O. Box 166 Bellevue 1464

Phone

Raleigh, N. C., 16 W. Martin St. Temple 3-2801
Columbia 1, S. C., 1203 Gervais St. Columbia 3-6676
Atlanta 3, Ga., 127 Peachtree St., N. E. Jackson 2-7805
Memphis 9, Tenn., 1929-B South 3rd St. Whitehall 8-2692
Columbia, Mo., P. O. Box 188 Gibson 2-4040

Indianapolis 20, Ind., 6060 College Ave. Clifford 5-5440
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St. Paul 4, Minn., 45 N. Snelling Ave. Midway 5-2884
Los Angeles 5, Cal., 2999 West 6th St. Dunkirk 8-3300
San Francisco 4, Cal., 235 Montgomery St. Yukon 2-6840

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Chemicals

217—TOXAPHENE INSECTICIDES

The use of toxaphene insecticides, to control various insect pests which attack tomatoes, is described in a new folder issued by Hercules Powder Company.

The leaflet discusses typical applications for the control of tomato hornworm, tomato russet mite, flea beetles, vegetable weevil, cutworms, tomato fruitworm, and blister beetles. For your free copy

CIRCLE 217 ON SERVICE CARD

218—POTASH FOR MODERN FERTILIZERS

U. S. Potash Co. has announced it has the first Higrade Granular muriate of potash designed specifically for the manufacture of today's modern fertilizer. Containing 62/63 per cent K_2O , the material is reported to be non-caking and free-flowing throughout. For more information,

CIRCLE 218 ON SERVICE CARD

219—FUR-AG CONDITIONERS

A bulletin is available from Quaker Oats Co. on Fur-Ag conditioner. It is sterilized—free from plant diseases, insects, and weed seeds, reports Quaker, and reduces bag set, promotes drillability, speeds up curing in the pile and provides bulk. For your copy of the bulletin

CIRCLE 219 ON SERVICE CARD

220—TRIPLE SUPER

U. S. Phosphoric Products Div. says its triple superphosphate is milled and screened to a consistently uniform fine texture that produces faster and more thorough agglomeration in your fertilizer processing. For more information on their products,

CIRCLE 220 ON SERVICE CARD

221—WET PROCESS PHOSPHORIC ACID

Information is now available from General Chemical Division on their commercial grade wet process Phosphoric Acid. The company claims it is not a by-product but made especially for such uses as the manufacture of phosphate salts, fertilizers and other applications. For free information just

CIRCLE 221 ON SERVICE CARD

222—NEW FLY KILLER

A two-color folder describing their new fly killer is now available from African Pyrethrum Development, Inc. The folder tells the most efficient and economical methods of using the new protectant, and also summarizes the official research results. For your free copy just

CIRCLE 222 ON SERVICE CARD

FREE INFORMATION to help you
solve fertilizer, pesticide problems

Reader Service

223—FARM SERVICE BULLETINS

The I. P. Thomas Division of Pennsalt Chemicals Corp. has just issued three farm service bulletins full of tips on how to increase yields of potatoes, tomatoes, and sweet corn in the Middle Atlantic states.

For your free copies just

CIRCLE 223 ON SERVICE CARD

224—BLACK LEAF PESTICIDE GUIDE

The Diamond Black Leaf Company has just issued a new, specially designed lawn and garden maintenance guide, which shows in simple, graphic terms how to control virtually all common garden problems involving insects, plant diseases and weeds.

For your free copy just

CIRCLE 224 ON SERVICE CARD

225—THIOSEMICARBAZIDE

Thiosemicarbazide, a reactive compound which behaves as a mono-acid base and is a strong reducing agent, is described in a new technical data bulletin issued by the Industrial Chemicals Division of Olin Mathieson Chemical Corporation.

The four-page bulletin gives information on physical and chemical properties, typical reactions, uses, literature references, and availability.

For free copy just

CIRCLE 225 ON SERVICE CARD

226—LIQUID TOXICANT CARRIER

The Minerals & Chemicals Corp. has new information available about their carrier, diluent and conditioner called Attaclay. For information about its use as a carrier for liquid toxicants just

CIRCLE 226 ON SERVICE CARD

How to use the READER SERVICE CARD

- Circle number of literature you want.
- Print or type your name, position, company and address.
- Clip and mail the Service Card.

227—TERRACLOR BULLETIN

A colorful technical bulletin on Terraclor has just been published by the Olin Mathieson Chemical Corporation. Terraclor is a new fungicide recommended for the control of a number of crop diseases, primarily certain soil-borne types. A copy of this bulletin is available free by just

CIRCLING 227 ON SERVICE CARD

Process Equip.

228—STURTEVANT MILL BLENDER LITERATURE

The Sturtevant Mill Company has published a new Rotary Batch Blender brochure. It gives specification information on all nine models of Blenders and shows how the rotary drum design saves plant space, including head room.

For your free copy just

CIRCLE 228 ON SERVICE CARD

229—OMEGA FEEDERS

The facts on Omega Hi-Weigh Feeders are included in a bulletin from Omega Machine Co. The manufacturer says leading fertilizer formulators choose the Hi-Weigh because of its high capacity, high accuracy, wide range, rugged construction, rapid rate setting, easy operation and maintenance. A copy of the bulletin is yours by

CIRCLING 229 ON SERVICE CARD

230—SACKETT STAR

The Sackett STAR Granulator will give you controlled grain size, higher product recovery, higher production capacity and lower drying cost, reports A. J. Sackett and Sons Co. Capacity range is from 15 to 60 tons per hour. For details,

CIRCLE 230 ON SERVICE CARD

231—MIXER BULLETIN AVAILABLE

The Read Standard division of Capitol Products Corporation has just published an eight-page two-color bulletin describing their complete lines of double-arm, spiral-ribbon and vertical mixers suitable for either laboratory and pilot plants or for commercial production.

For your free copy of this bulletin No. 1483 just

CIRCLE 231 ON SERVICE CARD

232—SPROUT-WALDRON BULLETIN

A new bulletin giving the details on their Pellet Ace has been released by Sprout-Waldron & Co.

All of the details of construction as well as the applications and many examples of the materials that have been pelleted will be found in the new bulletin.

For your free copy just

CIRCLE 232 ON SERVICE CARD

Packaging

233—SAVE TIME, MONEY, LABOR

Richardson Scale Co. says you can save time, money and labor with its Model FFP automatic bagging scales. A two-color, six-page bulletin gives a full description of the scales and includes 12 illustrations. Three styles are available—floor portable, overhead portable and overhead stationary.

For your free copy,

CIRCLE 233 ON SERVICE CARD

Materials Handling

234—CLARK BROCHURE

Engineering specifications, dimensions and mechanical features of the 5000 lb. capacity gas powered model in the Clark-lift line of fork trucks are contained in a new six-page, four-color brochure now available from the Industrial Truck Division, Clark Equipment Company.

For your free copy just

CIRCLE 234 ON SERVICE CARD

Miscellaneous

235—GRAVITY APPLICATION KIT FOR FUMIGANTS

Information is available from Fabricated Metals, Inc., on their new gravity application kit. The kit which attaches to a tractor is designed to provide more accurate application of fumigants.

The information is free. Just

CIRCLE 235 ON SERVICE CARD

How to use the READER SERVICE CARD

- Circle number of literature you want
- Print or type your name, position, company and address,
- Clip and mail the Service Card.

236—GOT A DUST PROBLEM?

If dust, fumes or odors are problem by-products of your plant Johnson-March engineers can help you eliminate them. The company claims 99 per cent efficiency in removal of fumes and comparable efficiencies for dust. For more free information about Johnson-March dust control just

CIRCLE 236 ON SERVICE CARD

237—NEW LIQUID METER

The Neptune Meter Company has just issued a 4-page bulletin describing their new stainless steel industrial liquid meter.

The bulletin includes cutaway illustrations, meter and register specification, and a list of liquids that can be measured with the new meter.

The bulletin is free—just

CIRCLE 237 ON SERVICE CARD

238—C&I PLANTS

An illustrated brochure has been prepared by The Chemical and Industrial Corp., designers and builders. C&I plants include complete facilities for producing nitric acid, ammonium nitrate solutions and solids, complex fertilizer, phosphoric acid and sulfuric acid. For your copy of the booklet,

CIRCLE 238 ON SERVICE CARD

239—PUSH BUTTON CONTROL

If you have ever wondered if your distributor is set on the right bin, it may pay you to investigate the Hayes & Stolz Electric Distributor. It removes all doubt by signalling accurately your loading position at all times, according to the maker. Position can be changed only by a numbered push-button on the control panel, assuring positive selection. For more details,

CIRCLE 239 ON SERVICE CARD

See pages 56 and 57 for information on these Reader Service Numbers—

240—Marion Mixers

241—Multi-Purpose Valves

242—Fork Truck Upright

243—Pocket pH Meter

244—Adjustable Nozzle

245—Sheet for Tank Linings

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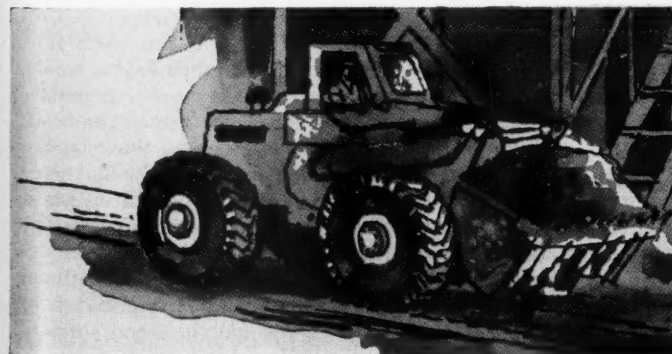
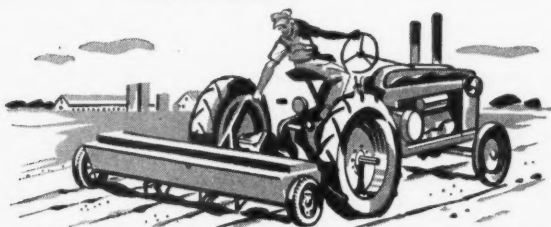
GRAFLOW^{T.M.}

REDUCES WEAR IN YOUR MIXING EQUIPMENT WHEN ADDED TO YOUR FERTILIZER

GRAFLOW is a conditioning agent for fertilizer that is paying for itself many times over in efficiently operated fertilizer plants. Added, as an ingredient, in either pulverized or granular form, GRAFLOW substantially reduces corrosion of the equipment in the mixing cycle. GRAFLOW reduces caking, and it increases flowability of your product.

THERE'S NEW SALES APPEAL IN A GRAFLOW TREATED PRODUCT

GRAFLOW is basically one of nature's finest lubricants and coating agents. Because it so greatly improves handling and reduces wear and corrosion in farm-fertilizer-spreading-equipment, GRAFLOW can provide an additional and effective sales and advertising advantage to your product. Write to our Chemical Development Department for complete information.



GA 241-1

THE UNITED STATES GRAPHITE COMPANY

DIVISION OF THE WICKES CORPORATION, SAGINAW 16, MICHIGAN
GRAPHITAR® CARBON-GRAPHITE • GRAMIX® SINTERED METAL PARTS • MEXICAN® GRAPHITE PRODUCTS • USG® BRUSHES

NEW LOOK FOR FLY CONTROL

THE control of the fly population on beef and dairy cattle has long been an important problem to farmers. Most entomologists believe that stable flies and horn flies reduce weight gains by as much as one-half pound per day and retard milk production by ten to twenty per cent on cattle heavily attacked by these pests. The search for an effective insecticide to combat this menace has been going on for many years with questionable results and lately, science has turned to repellency for the answer.

Repellency, for all practical purposes, in insect control, is a relatively new term. (The only major development in the repellent field in the past 14 years was Crag Fly Repellent, a Union Carbide product. They promoted its use with fly-killing insecticides.) The only fly repellents used in the past were actually insecticides. They exerted repellency for a short time but their main effectiveness was in killing a percentage of the insects. Although the percentage was large, the constant use of any insecticide builds up an immunity in time. This calls for a stronger insecticide which, when used, builds up a stronger immunity in the flies, and so the circle can go.

Tabutrex, recently registered and approved by U.S.D.A., is a colorless and odorless repellent. One of the advantages of Tabutrex is that it drives flies away and keeps them away for long periods of time with just one application. Another advantage is that by repelling flies, it prevents damage from being accomplished. When toxicants are used, the fly alights, sucks the blood of the animal, then flies away and dies. Although the insecticide eventually destroys the pest, the damage has been done—the weight of the animal has been retarded or the milk production curtailed. This is probably a revengeful way of dealing with the fly but revenge obtained at such a cost cannot be considered as an answer to the problem. With Tabutrex, the fly cannot alight, it cannot bite or in any way affect the well being of the animal and that is the object of the cattlemen—to prevent damage, not to wreak vengeance.

In a milk test, Tabutrex was tagged with radioactive carbon-14 and sprayed on a dairy cow daily for three weeks. Dosage was approximately 5 to 7 times greater than recommended. Samples of milk

were then subjected to extremely sensitive Geiger counter test methods to determine whether or not any of the Tabutrex had reached the milk. This test would have revealed the presence of one part Tabutrex in 15,000,000. No Tabutrex was found.

Hundreds of tests have been conducted in the laboratory and in the field with Tabutrex. Following is a summary of a few of those tests:

1. After 28 hours, cattle treated with Tabutrex showed 70.6 per cent repellency to stable flies; another commercial repellent containing a toxicant was 42 per cent repellent for the same period.

2. Tabutrex in oil was applied with one flat tee-jet nozzle in treadle sprayer over the cow's backs. Eight hours later, horn fly counts on ten cows totaled ten—horn fly counts on untreated cows totaled 1,150.

3. Tabutrex was applied to six calves. Eight hours after the spraying, total numbers of house and stable flies on treated calves was 13—on untreated calves, count was 129.

4. Quotation from a field investigator's report: "The wood surfaces sprayed were barn doors, walls of calf pens, and window frames. The walls of the calf pens before spraying, were covered by 30 to 50 flies per square foot. The pens were located in barns and other areas which were windless and warm, with usually only one window open on the south side. All of the calves were sprayed on their backs, flanks, rumps, thighs and foreheads. They were continually bothered by biting flies, especially around the head, flanks and rumps. The flies were so thick on the calves that the animals bleated all night and were continually nervous. The duration of effectiveness was apparently affected by the amount of air exchange around the animals. Those animals which were exposed to the elements or were subject to continual drafts were fly-free for at least 48 hours but not more than 72 hours. The calves and the wood surfaces in the calf-pens were fly-free for four to six days. (Adjacent areas of the barn, separated by wall and door, continued to have high fly populations.) When these areas were sprayed, the flies made hurried exits from the areas often landing on the spray operator. The calves relaxed immediately after being sprayed."

FIRMS from the U. S. may now establish what are termed "sanctuary corporations" or holding companies in Mexico, whose only purpose would be to act as depositories for foreign earnings.

The Mexican Treasury Department, through Secretary Antonio Carrillo Flores, has given tacit approval to the establishment of haven corporations. However, it should be noted that Mexico's willingness to accept haven capital is strictly contingent on the willingness of the U. S. Treasury to regard this procedure (held in some quarters as a gimmick to evade payment of income taxes by corporations) as legal.

**Tacit approval given to
"holding companies" if
U. S. Treasury will go along.**

"Holding Companies" OK in Mexico

By Emil Zubryn

Both governments have always cooperated in the past closely on mutual tax problems. The Mexican Government, according to a Treasury official, would never sanction any practice which meets with U. S. Treasury disapproval.

Actually, the Mexican Government is basing its "open door" policy to holding corporations on Article 28 of the Ley de Impuesto Sobre la Renta (Income Tax Laws) which states: "Whenever the nature and characteristics of a taxpayer's activities are such that it is not possible, within normal procedures, to make an exact determination of the taxable income, the Secretaria de Hacienda (Treasury Department) may enter into an agreement to determine the tax base."

This interpretation can permit holding corporations a tax-free haven on payment of a specified fee; or at a very low tax rate.

Haven corporations are not new and Mexico is only following the example set by a number of other nations, including Canada, Venezuela, Honduras, Bermuda and the Bahamas, Lichtenstein and Switzerland.

The holding corporation is not always a tax dodge. Rather it is a means of flexibility for firms in overseas operations. Mexican holding companies, for example, can be depositories of monies from various foreign subsidiaries (including a Mexican subsidiary if the firm operates one), with these funds distributed to other areas for plant expansions, modernization, advertising and promotion, etc. In other words, the operation is something like that of a company international banking system.

Mexico will not permit holding corporations to engage in commercial or industrial operations. But a firm *does* have the right to establish a Mexican subsidiary for this. The holding company must be strictly that: a depository for funds received from abroad or from a Mexican branch which is subject to the normal Mexican federal income tax. The Treasury Department has not ruled on this as yet,

but it is probable that a suggestion will be made that a certain percentage of funds be invested in Mexican securities.

Hugo Margain, Mexico's Income Tax chief feels that holding companies will be a beneficial project not only for firms undertaking this sort of financial sanctuary, but for Mexico as well. Mexico can protect sanctuary capital because of its strong, *and* constantly improving financial position (at last count the Treasury had a reserve of over \$305,000,000 dollars in paper and over \$165,000,000 dollars in gold reserves) and the republic is one of the most stable of south-of-the-border republics.

There may be risks—Mexico might change its laws (as was done in the expropriation act of 1938 which seized foreign oil installations; and there has been recent talk that the same sort of procedure should be undertaken with Mexico's rich sulphur deposits, although this is only rumor) and the U. S. Treasury could rule that a holding company abroad is not exempt from normal taxation. Likelihood of both these prospects is slim because (1) Mexico is eager to attract foreign capital and it believes that holding companies would invest part of their funds in the nation's industrial development and (2) the U. S. Treasury policy too, seems to be to aid and not imperil foreign investments.

Firms interested in a Mexican holding corporation can contact the Mexican Treasury Department or Licenciado Hugo Margain, Mexican Income Tax Commissioner, Govt. of Mexico, Mexico, D. F. Or, an even better procedure is to contact the Mexican consul nearest the firm's headquarters. The holding company angle may also be available to smaller firms through a separate set up, but this is still awaiting outcome of negotiations for establishment of holding companies in Mexico by major U. S. firms. These will serve as "pilot models" for rules and regulations and conditions to be worked out by the Mexican government for all future agreements for "asylum" for foreign-earned U. S. dollars of American Corporations.



putting fertilizer in the bag

WHAT'S in the bag of fertilizer is important to the farmer, but getting it in there is an important operation to the fertilizer mixer.

F. W. Tunnell & Company, Inc. of Philadelphia, Pennsylvania, producers of fertilizer, hide, glue and inedible grease from animal hides, was faced with this "getting it in the bag quick and economically" problem as are many other mixers.

"We began using multiwall paper bags for most of our fertilizer shipments about 1939," commented Mr. A. E. Horner, fertilizer plant superintendent for Tunnell.

"At that time we tried packaging our fertilizer in open mouth multiwall bags," explained Mr. Horner. "Our first tests were unsatisfactory because of the low production rate. Using an automatic scale, we could only fill and close seven or eight bags per minute. By changing to multiwall valve bags and valve bag packer we were able to fill and close as many as 13 bags per minute."

Then in early 1955 they switched back to open mouth bag packers. They got two Union I&C Baggers and two sewing machines and pedestals. They had originally started this system with gusset type bags, but changed to the flat bag after about 14 months, since the flat type is easier and faster to handle.

"By changing from valve-type bag packers to open mouth bag packers, we were able to step our production rate up from 13 bags to 18 bags per minute per machine," commented Mr. Horner, "and we found that this system was easier to maintain and adapted faster when changes occur in bag types."

"Our work is spasmodic in the sense that we have a heavy demand for fertilizer in the spring months, but this in turn is governed by the weather. When the skies are clear, our business is good; when it rains, we have to slow down. We bag our fertilizer as it is ordered. The truck making the pickup pulls into our docks (capacity: three trucks) and places his order. The type of fertilizer wanted is relayed

to the operator of a bridge crane, who uses his 2½-cubic-yard clamshell bucket to scoop up the desired material and load it into the crane hoppers (one for each of the two packing machines). The material passes through a shakeout screen to the hopper above the bagger. The weighing and filling cycle is completely automatic. The bag filling operator presses the starter button which automatically delivers the pre-weighed fertilizer through the machine's bag chute in an endless series.

"The filled weight drops each of the open mouth multiwall bags on to a conveyor of our own design which carries it at 40 feet per minute to a sewing machine. Here an operator slips the bag's mouth through the machine, and it is stitched shut with 5/12 sewing twine, needle and looper. The closed bag then falls onto a 24" rubber belt and is carried onto a conveyor system which can deliver to any one of three trucks. Three 24 foot retractable conveyors are electrically extended into the truck vans to facilitate loading. These are gradually retracted as the truck is loaded.

"We use three sizes of multiwall bags for packaging fertilizer . . . 80 lbs., 50 lbs. and 25 lbs. The bags carry an attractive design, printed in red and blue for our animal-base fertilizers and green for our chemical base or commercial fertilizers. This design was created for us by the same company which sold us the open mouth bag packers. Every dealer is well aware of the impact of a clever package design at the point-of-sale and our new design has resulted in many favorable comments from our customers.

"Our two basic fertilizers are divided into about 35 analyses," said Mr. Horner. "There is no such thing as an average order at this plant . . . the trucker may pick up as much as 22 tons of an analysis, or only one bag. The vast majority of our packing (75 per cent) is done in multiwall paper bags, and

most of this is bagged in 80-pound units. Burlap bagging is done as requested. Consequently we require versatility in our packer. During a busy day, we will bag as much as 500 tons of fertilizer, of which 120 to 150 tons may go into burlap. Our new baggers permit us to switch to burlap bagging faster than the old valve-type system, saving 2 to 3 minutes on the switchover. During our heavy production period (six weeks in March, April and May), we may switch over 20 to 25 times daily. Therefore, whatever system we are using must be adaptable in this direction. The open mouth bag packers have worked out quite well for this purpose.

Mr. Horner concluded, "The present system is certainly faster, more versatile, and less expensive than any bagging system we have had in the past."



A. E. Horner, plant superintendent, is shown here with an open mouth multiwall bag which carries the new package design.

A moving conveyor carries the filled fertilizer bags to the sewing machine. Here the operator stitches closed the tops of the bags after which they travel by conveyor to the truck loading area.



Fertilizer Situation for 1956-1957

The supply of nitrogen and potash available for fertilizer purposes in the United States for the 12-month period ending June 30, 1957, is estimated by the U. S. Department of Agriculture to have been slightly greater than during the previous 12-month period.

Phosphate supplies, on the other hand are reported to have been sufficiently smaller than in 1955-56 so that the total of the three primary plant foods available for fertilizer purposes during 1956-57 was slightly less than in the previous year.

These estimates are contained in USDA's "Fertilizer Situation for 1956-57."

Following are comparative figures on supply for the past two years according to the USDA report:

	1956-57	1955-56
	(thousands of tons)	
Nitrogen (N).....	2,265	2,251
Available P ₂ O ₅	2,352	2,402
Potash (K ₂ O).....	1,874	1,862
TOTAL.....	6,511	6,515

Figures for nitrogen and potash are based on published data for the first nine months of the fiscal year and an estimate for the remaining three months. The phosphate figures are based on eight months' published figures and estimated rates of production for the remainder of the year.

There were significant increases in the export of phosphates and potash, while nitrogen exports were about the same as in the previous year.

Imports of nitrogen decreased moderately, while imports of potash increased somewhat and those of phosphate held about steady.

U. S. production is estimated as follows:

	1956-57	1955-56
	(thousands of tons)	
Nitrogen (N).....	2,231	2,176
Available P ₂ O ₅	2,521	2,499
Potash (K ₂ O).....	1,940	1,872
TOTAL.....	6,692	6,547

The 1956-57 fertilizer season was slow in starting. Throughout much of the fertilizer year great sections of the country suffered from extreme drouth. During the first and second quarters reports from the mid-South, mid-West, and Southwest indicated severe crop damage due to high temperatures and lack of moisture. In the Northeast vegetable crops and pastures were hard hit by dry weather.

Spring deliveries (March-April) were reported to be spotty with some price cutting, due in part to the slow market. Heavy spring rains, even disastrous floods in some areas, prevented farmers from spreading fertilizer. More normal rainfall in sections of the mid-West, on the other hand, caused an upturn in movement in these sections.

With no yardstick, and no historic pattern to use as a guide, it is hard to predict the impact of the Soil Bank on fertilizer use. Should foreseeable markets seem sufficiently attractive to cover costs and return a reasonable profit, it is logical to suppose that farmers would use more fertilizer on a reduced acreage. However, without experience under this program realistic forecasts cannot be made.

The fertilizer industry, particularly in the case of nitrogenous materials, has more production capacity than it can use at present. However, both private and Government market analysts predict that this is a temporary condition and that demand will be equal to capacity within less than five years.

It is expected that growing demand for all fertilizers will result from increased use in present farm operations as well as from numerous new practices.

Agronomists have pointed out repeatedly that farmers' income could be raised substantially by using fertilizer in accordance with recommendations by State experiment stations. In one southern State, for example, it was estimated that farm income in 1955 would have been increased by over \$200 million if approved fertilizer recommendations and other cultural practices had been followed. This is a matter of education, and many segments of the industry are sponsoring demonstration programs.

Pasture and range fertilization offer opportunities for profitable use of fertilizers. Field trials in a number of different areas show that such practices substantially increased growth of grasses and legumes. Livestock turned on such lands showed marked weight increases over stock on non-fertilized fields.

Farm ponds are becoming increasingly important, both as a supply of food and for recreation. It has been found that by fertilizing microscopic plant growth in these ponds the weight of fish can be boosted by as much as 400 per cent.

Another potential outlet for the fertilizer industry is fertilization of forests. Already practiced to some extent in Europe, this use of fertilizer has only recently been given attention in the United States.

NITROGEN: ESTIMATED 1956-57 FERTILIZER SUPPLY COMPARED WITH 1955-56 AND 1954-55, UNITED STATES AND POSSESSIONS ¹

(In tons of 2,000 pounds nitrogen content)

Item	1956-57 ²	1955-56	1954-55
U. S. Production			
Synthetic ammonia	2,023,000 ¹	1,945,000	1,791,000
By-product ammonia	178,000	201,000	183,000
Natural organics	30,000	30,000	30,000
Total	2,231,000	2,176,000	2,004,000
Imports	287,000	330,000	373,000
Exports	253,000	255,000	141,000
Difference	34,000	75,000	232,000
Available for fertilizer purposes	2,265,000	2,251,000	2,236,000

¹ These figures are based on rates of production plus imports and minus exports.

² Estimated.
Source: USDA Fertilizer Situation Report for 1956-57.

PHOSPHORUS: ESTIMATED 1956-57 FERTILIZER SUPPLY COMPARED WITH 1955-56 AND 1954-55, UNITED STATES AND POSSESSIONS

(In tons of 2,000 pounds available phosphoric oxide P₂O₅)

Item	1956-57 ¹	1955-56	1954-55
U. S. Production			
Normal and enriched superphosphate	1,585,000	1,604,000	1,601,000
Concentrated superphosphate	736,000	775,000	661,000
All other ²	200,000	120,000	76,000
Total	2,521,000	2,499,000	2,338,000
Imports	54,000	56,000	61,000
Exports	223,000	153,000	154,000
Difference	169,000	97,000	93,000
Available for fertilizer purposes	2,352,000	2,402,000	2,245,000

Based on 8 months' published figures and estimated rates of production for remainder of year.
Includes wet-mixed base goods, basic slag, liquid

phosphoric acid, and P₂O₅ content of mixed fertilizers.
Source: USDA Fertilizer Situation Report for 1956-57.

POTASH: ESTIMATED 1956-57 FERTILIZER SUPPLY COMPARED WITH 1955-56 AND 1954-55, UNITED STATES AND POSSESSIONS

(In tons of 2,000 pounds of potassium oxide K₂O)

Item	1956-57 ¹	1955-56	1954-55
U. S. Production			
Muriates ²	1,800,000	1,739,000	1,687,000
Sulfates ²	111,000	106,000	107,000
Manure salts ²	3,000	2,000	1,000
Other ³	26,000	26,000	26,000
Total	1,940,000	1,872,000	1,821,000
Imports ⁴	184,000	170,000	139,000
Exports ⁴	250,000	180,000	91,000
Difference	66,000	10,000	48,000
Available for fertilizer purposes	1,874,000	1,862,000	1,869,000

¹ Based on actual production for 9 months and estimated rates for remainder of the year.

² Reported by the American Potash Institute.

³ Includes potash content of natural organics and miscellaneous fertilizers.

cellaneous fertilizers.
Bureau of the Census Reports No. FT 110 and FT 410.

Source: USDA Fertilizer Situation Report for 1956-57.

Non-farm use of fertilizer—application to parks and roadsides, lawns and home gardens—has increased continuously in recent years.

Industrial uses of ammonia, which now represent approximately 24-25 per cent of production are expected to increase. Present expanding uses for

ammonia include the production of chemicals, plastics, explosives, and synthetic fibers. It is believed that continued research will develop new industrial uses for ammonia that, with growing agricultural consumption, could span the gap between present

(Continued on page 68)

THE NEED FOR SIMPLIFICATION OF PESTICIDES IN COTTON CONTROL

O. T. Guice, Jr.
General Inspector
State Plant Board of Mississippi

PRIOR to the entry of the boll weevil into Texas in 1892 and its spread throughout most of the cotton producing South by 1916 or 1917, cotton production must have been quite simple. Some of the earlier recommendations for the control of this pest was to pick the adult weevils by hand and also to collect and destroy the punctured squares. This, of course, was an endless task and proved to be impractical. Through the ensuing years, the boll weevil caused such destruction that the entire economic structure of the South was drastically affected. Within a few years, after the boll weevil spread across the South, a number of arsenical formulations gained a foothold for its control. During the early '20's, or a few years before, calcium arsenate was generally recognized as the most outstanding cotton poison and remained so until the advent of the chlorinated insecticides in 1945 and 1946.

Calcium arsenate, while effective in the control of the boll weevil and generally against the bollworm, was not effective in the control of sucking insects, most of which were minor pests of cotton, such as the cotton fleahopper, tarnished plant bug, thrips, cotton stainer and others. Calcium arsenate, however, had one serious drawback. It killed many of the parasitic and predacious insects which normally held the cotton aphid in check; consequently, serious and damaging infestations of aphids would often result following its use. Thus the aphid would often cause as much or more damage than the boll weevil. Because of the aphid problem, nicotine sulfate was combined with the calcium arsenate to control the aphid. This combination, however, was not entirely satisfactory because the nicotine sulfate, being a highly volatile material, killing mostly by its fumigating action, had to be applied under very ideal conditions. This combination was the first cotton insecticide combining two materials which gained any major foothold in cotton insect control.

Because of the aphid problem, brought on by the use of calcium arsenate, research was begun early to try and work out the best methods and most

economical schedule of application. There were two lines of thought, one was to wait until the cotton plant had grown large enough to have many fruiting positions on it, and then put on a very intensive control program. The other was to begin poisoning early and kill as many weevils as possible, thus reducing the chance of early population pressure. Basically the late starting program was to make two, three or four applications of calcium arsenate and when there were signs of an aphid infestation, to apply one or two applications of the calcium arsenate-nicotine sulphate mixture mentioned earlier. The early starting program was to start at the first sign of weevils and poison when needed until the crop was safe. The aphid problem was the major drawback to this program.

The program of waiting late to begin a poison schedule, however, had some major drawbacks, chief of which was the fact that the late developing generations of weevils are much harder to kill than the earlier generations, and by waiting late there was a tremendous population of weevils which resulted from no attempt to control them earlier. The entire calcium arsenate program boiled down to whether to wait until late to start and then put on an intensive and expensive fight against the weevil and a generally late aphid infestation, or to put on an early fight against the weevil and having to fight the weevil and the aphid over most of the fruiting period. Throughout the history of calcium arsenate as a cotton insecticide, a tremendous amount of research was carried on dealing with the physiology and fruiting habits of the cotton plant, as related to cotton insect control. A great deal has been learned, but even today this type of research continues. This is essential, because any trained entomologist working with cotton insects and especially the boll weevil knows that there is a direct relation between fruiting of the cotton and economical control of the weevil and other pests of cotton. This is one of the first things that a young cotton entomologist must learn to correlate. I will not attempt to go into research on fruiting of cotton because much is involved, including soil, fertilizer, moisture, temperature, and other factors. All of these factors enter into rec-

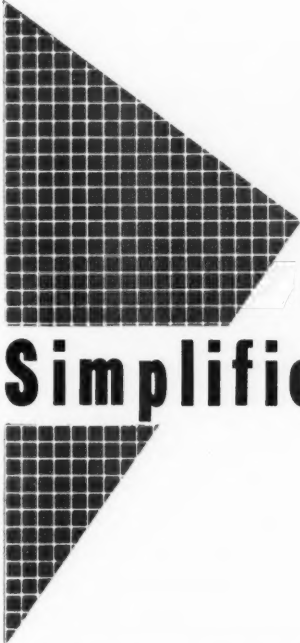
The following two articles are taken from speeches presented at the 15th annual convention of the Association of Southern Feed and Fertilizer Control Officials—June 1957.

ommendations today as much so as during the calcium arsenate days.

As mentioned earlier, the late generations of weevils are harder to kill than the earlier generations. It is generally recognized that if the first generation of weevils, that is the generation developing from eggs deposited by the over-wintering weevils, can be largely eliminated, high and profitable yields of cotton will be produced. With the advent of the chlorinated insecticides in 1945 and 1946, it appeared as though this might be possible. However, during the last two or three years, weevils have developed almost complete immunity to the chlorinated insecticides in some areas. This resistance will no doubt eventually spread throughout all the weevil infested areas. The phosphorus insecticides offer some hope against the resistant weevils, at least for the time being. It remains to be seen how long it will be before resistance to this group of insecticides will result.

There are some seven or eight of the chlorinated insecticides which were found to be effective against cotton insects. The first of this series of chlorinated insecticides which was especially effective against the boll weevil was BHC and more especially the gamma isomer of this compound. It is also effective against a wide range of the sucking insects, including the cotton aphid. Its drawback, however, is the fact that it killed many of the parasitic and predaceous insects of the bollworm, thus a bollworm infestation often resulted following its use. This situation parallels somewhat the calcium arsenate situation except that bollworms were involved rather than aphids. In addition to the bollworm problem, spider mite infestations often resulted not only following BHC, but also following the use of other chlorinated materials. Thus a new problem, especially in the central and eastern cotton belt, came into existence. DDT had been found to be effective against the bollworm and in the more arid sections where the spider mite had been a problem, sulfur was the generally recognized chemical used against this pest. Since neither BHC, DDT or sulfur used alone was effective for the control of the range of insects involved, it seemed logical that a combination of these three materials would be a complete cotton insecticide. As a result, there came into existence the well known 3-5-40 cotton dust, meaning 3 per cent BHC, 5 per cent DDT and 40 per cent sulfur. This combination seems to have set the pattern for the future nomenclature of cotton dust formulations and to some extent liquid formulations. We now have aldrin, BHC, DDT, endrin, dieldrin, heptachlor and toxaphene, all of which may be used alone or in combinations that have been, or are being recommended for cotton insect control. In addition to these chlorinated materials, recently the phosphate insecticides such as methyl parathion, malathion, guthion and some not so widely used such as TEP, parathion and others, have come into the picture. All of these materials, including the chlorinated and phosphate groups, seem to be compatible and as a result are formulated alone or in any com-

(Continued on page 48)



NACA Looks at Simplification

L. S. Hitchner
Executive Secretary
NACA

At the present time we hear much about standardization and simplification. It is important first that we understand what we are talking about as these terms are often used interchangeably. However, they should not be.

Standardization essentially means a setting of certain specifications in an effort to assure the quality of a product. Simplification is the elimination of some products from the market place, with sales restricted to certain specified products or formulations. When we say that a product must meet certain minimum and maximum specifications on the various components thereof—this is standardization. When we say that *only* products containing 10, 25 or 75 per cent of certain ingredients can be sold or used—this is simplification.

The development and marketing of pesticides is one of the most dramatic demonstrations of what free competition means to the farmers and growers of this country. Where 20 years ago he had one product to control a certain pest, today the farmer can make a selection from several effective materials for practically every pest control problem.

Attempts have been made to force simplification on the Pesticide Industry. We have opposed and are opposed to this when done by legislation or regulation. There is an established voluntary and legal procedure for achieving this, if desirable. It is provided for in the so-called "Simplification Program" of the U. S. Department of Commerce.

As previously pointed out, the Pesticide Industry has a record of supporting sound control legislation. Our industry assumes the burden and costs of most of the research, registration and other costs due to regulations to assure that the farmer gets a good product.

Present legislation is fully adequate to keep off

(Continued on page 48)

Pesticide Simplification (Continued from page 47)

bination conceivable. Some of the more common formulations are, as mentioned earlier, 3-5-40, 3-0-0, 3-5-0, 3-10-0, 3-10-40, and many other formulations ranging from one per cent BHC through six per cent BHC in combination with from five per cent DDT through twenty per cent DDT, with or without sulfur. This same general picture is true with aldrin, dieldrin, heptachlor and toxaphene, and to some extent with endrin.

The phosphate insecticides have further complicated the picture as requests for registration of these materials in combination with almost any of the chlorinated materials are quite common. We have requests for registration of such formulations as 5 per cent BHC in combination with 5 per cent DDT and 5 per cent malathion or requests for registration of such combinations as 3 per cent BHC, 5 per cent DDT and 2½ per cent methyl parathion, or, as mentioned earlier, any formulation that can be conceived by the human mind. In addition, the

so called special lime free, low lime or neutral calcium arsenate is to a great extent compatible with the chlorinated and phosphate materials, thereby opening up another wide field of possible combinations.

While I have been in regulatory entomology during most of my twenty years as an entomologist, it seems logical that some system of grade standardization could be worked out by research entomologists. Through some standard and dependable test, it is likely that some of the cotton insecticides used today would show enough variation for them to be classed Grade A, B or C, or some other designation. If this could be done, many of the formulations of today would be eliminated. If some simplification of cotton pesticides is not made, the cotton producer is going to become disgusted, as he is today in many cases, and we, as pesticide regulatory officials, are going to be on the front line of fire. With some system of simplification, both industry and the cotton producer will no doubt profit.

NACA VIEW

(Continued from page 47)

the market inferior products which will not effectively control the pests for which they are recommended and sold. Simplification is not necessary to insure that the grower receives a good product at a fair price.

Enforced simplification would interfere with the rights of the manufacturer to sell and the rights of the buyer to select a product he wishes from a number of effective materials. This would be equivalent to prohibiting a person from buying a Cadillac because some official has decided that a Ford is better for him.

We recognize that there are valid reasons for one one state recommending a certain product while another does not. However, we do object to proposals which would arbitrarily limit the number and kind of formulations which could be sold and used for a specific pest control program.

It is not sound to give to any government official the right to arbitrarily refuse registration of any effective and properly labeled product. To do so will lead to a situation where the sale of pesticides would depend on the opinions, prejudices, honesty and subjective judgment of some individual. Many effective chemicals and formulations will ultimately be barred from the market if pesticides are so restricted. The farmer would suffer since manufacturers could not afford the expense and would not undertake research necessary to develop new products if their ultimate use depended on the arbitrary decisions of one or two individuals.

There is another ramification to the matter of simplification which also must be considered. If government takes over the function of specifying what pesticides the farmer can use it must also assume the responsibility for any failure of specified materials to control pests, and must assume responsibility for violations of any statutes, such as the

Miller Amendment to the Food, Drug, and Cosmetic Act.

We recognize that there has been standardization and simplification in regard to fertilizers in many states. We have no views as to whether this is good or bad with reference to fertilizers, since we are not experienced in that field. However, we think there is a big difference between standardizing and simplifying fertilizer formulations where there are only three principal ingredients, N, P and K, as compared to pesticide formulations which may be compounded from any number of some 200 active ingredients.

The views of the National Agricultural Chemicals Association in relation to "Standardization and Simplification" have received powerful support from an important segment of our economy—the farmer. Following is a news story that appeared in the June 28th edition of the New Orleans Times-Picayune:

"Cotton farmers from throughout North Louisiana charged here yesterday that Agriculture Commissioner Sidney McCrory shouldn't have the authority to force them to use any particular type or strength of insecticide.

"In a two-hour hearing conducted at the Richland Parish Courthouse here by the Cotton Advisory Committee of Louisiana Farm Bureau Federation, more than 100 farmers from 13 parishes agreed it should be their privilege to choose the kind or type insecticide they wanted to use, even though it might ruin their crop, so long as it was not a menace to other persons.

"Triggering the controversy was a ruling by McCrory which prohibits manufacture and sale in Louisiana of an insecticide called methyl parathion in mixtures of less than five per cent strength. Ernest A. Epps of Commissioner McCrory's staff explained that the ruling followed recommendations of the LSU Experiment Stations which showed that less than a 5 per cent methyl parathion per acre in applications of 10 pound per acre would not kill the boll weevil.

"Cotton producers at the Farm Bureau hearing said, however, that 2½ per cent methyl parathion had proved effective in some areas of the state. The 5 per cent mixture costs about \$5.50 more per 100 pounds. Jack Hamilton of Lake Providence, president of East Carroll Parish Farm Bureau said... the farmer should have the privilege of choosing the poison he wants, regardless of recommendations, 'so long as it doesn't endanger the public health.' He said producers in his area were now buying the weaker strength insecticides in Mississippi and Arkansas, which allow its production."

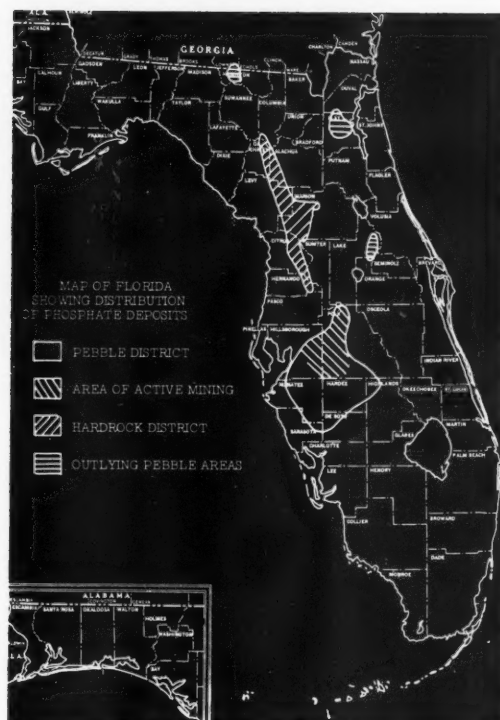
The Phosphate Industry In Florida

I. M. LeBaron, Vice-President of Research
International Minerals & Chemical Corporation

IN central Florida, an area some fifteen by thirty miles, is the production center for the largest tonnage of phosphate rock in the world. The total world production is estimated to be thirty million tons per year. The United States production is approximately fifteen million tons per year and, of this, an estimated eleven million tons will be produced in this area of Florida this year.

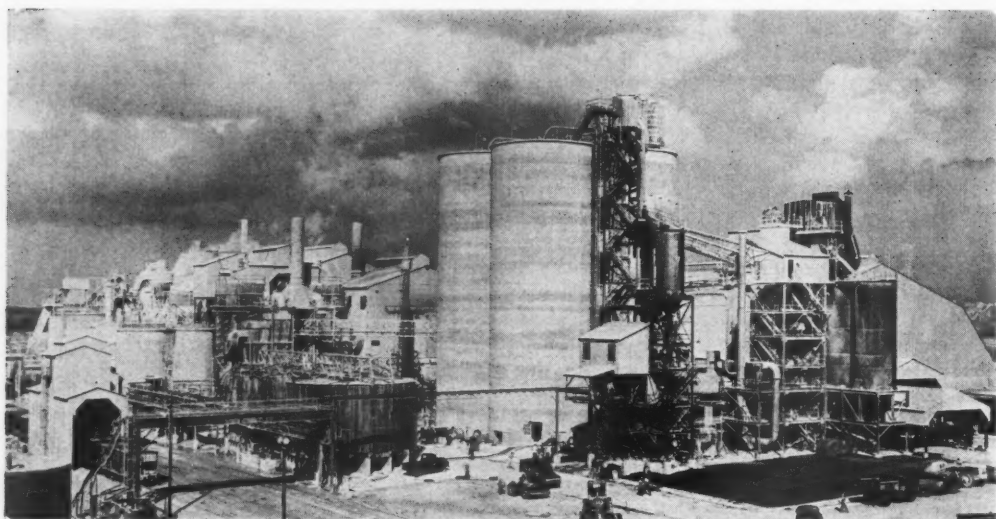
► The area included in the mining operations is quite flat and lies at an elevation of 100-150 feet above sea level. There is usually an average of 15-20 feet of overburden which may contain some phosphatic values too low in P_2O_5 content to process. Below this overburden some 10-30 feet of material designated in the field as matrix is encountered. Matrix is made up of three constituents: clay slimes, which are extremely fine; silica sand; and phosphate pebble, ranging in size from a small quantity at one and a half to two inches down to 400 mesh. The screen size distribution of the pebble will vary considerably from one location to another.

AUGUST, 1957



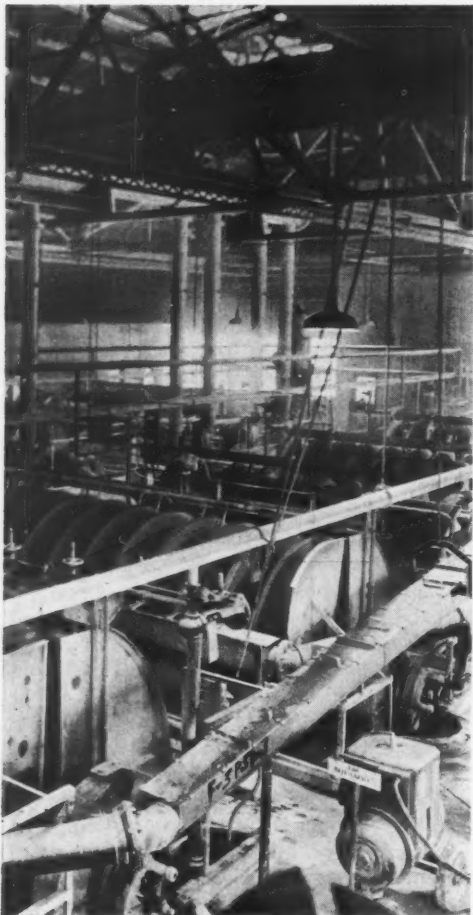
While deposits are fairly uniform, it is necessary to prospect areas to be mined to determine the depth of overburden and matrix and also the yield of product per acre and grade of product which can be produced. The number of prospecting holes will vary from four to sixteen holes per forty acres, depending upon whether the survey is exploratory or prior to actual mining.

► Large draglines are used in the mining operation. Bucket capacities of these machines will vary from 15 yards to 26 yards. The largest of these machines is capable of mining 2400 tons per hour. If this tonnage were to be loaded into railroad cars, a 48-car train would be required to handle only one hour's output. In size, complexity, power and versatility, these draglines represent engineering masterpieces that make possible the leading position this country occupies in the production of phosphate compared with the rest of the world. The task of these draglines is to remove the overburden and then to dig the ore and dump it into a well or sump. From here it is



A view of the dicalcium phosphate producing units at International's Bonnie plant near Bartow, Fla. The huge silos seen in the background have a 4,000 ton capacity each, and are used for storing dicalcium phosphate.

A view of the filtration units inside the Bonnie plant where gypsum is separated from phosphoric acid in the manufacture of triple superphosphate and dicalcium phosphate.



sluiced with streams of high pressure water to the suction of a large pump and then transported through pipelines to the washing plants, which may be a mile or more away. At a large installation this pump will move 8000 gallons a minute through a sixteen inch diameter pipeline.

► Washing is a process of screening the ore, now combined with water and referred to as "slurry". This process separates the clay, sand, and fine phosphate from the pebble phosphate which is retained on the screens. This pebble is then scrubbed free of adhering clay and sand, screened again and placed in bins. From these bins it is loaded into railroad cars for shipment to the drying plant. Prior to the discovery of the flotation process, this pebble fraction was all that could be recovered. Now additional recovery of the fine phosphate removed in washing is possible. As a preparatory step for flotation, the clay, sand, and fine phosphate flow by gravity to a large settling tank called a "hydro-separator". There the clay overflows; the phosphate and sand settle to the bottom. The clay slime is pumped or flows by gravity to large settling areas, generally mined out pits.

► Flotation concentration begins as the material is transported into the plant by an endless conveyor belt and then thoroughly mixed with prescribed amounts of caustic soda, fuel oil, kerosene, and tall oil. Water is then added and the resulting mixture flows into flotation machines. Upon the admission of air, the mixture is subjected to violent mechanical agitation which serves to keep the phosphate and sand in suspension and to break the air into millions of minute bubbles. As these rise to the surface, the

phosphate particles attach themselves and are carried upward much like a balloon would ascend with a basket in the atmosphere. The phosphate accumulates as a soapy froth on the surface, is scraped off with revolving paddles, and moves on to a collecting tank. This process may be repeated for improved recovery and quality before the phosphate concentrate is ready for dewatering and transporting to the drying plant. In some cases other separation techniques are used involving spirals and tables. Spirals are used quite economically on the -1 millimeter $+35$ mesh fraction of the ore, and are simpler in operation than flotation cells.

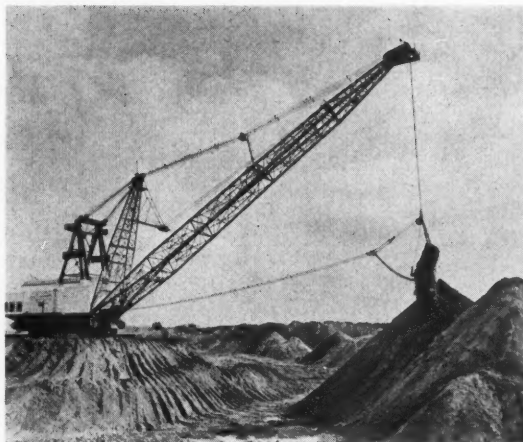
► Drying is necessary before the product can be shipped to the customer, for two reasons. First, because the customer's processes generally require a dried phosphate, and second, to eliminate freight charges on the 10-15 percent moisture in the undried product. This is accomplished in large oil-fired rotary dryers, drying as much as 250 tons an hour. Interesting is the fact that freight charges on phosphate often exceed the selling price.

► Stockpiling means storage piles of pebble and concentrate ore separated according to the various grades produced. Because the phosphate market is somewhat seasonal, these storage reserves are maintained to insure sufficient tonnage of the proper grade to meet the demands of both domestic and foreign customers. At times a stockpile may contain in excess of 500,000 tons.

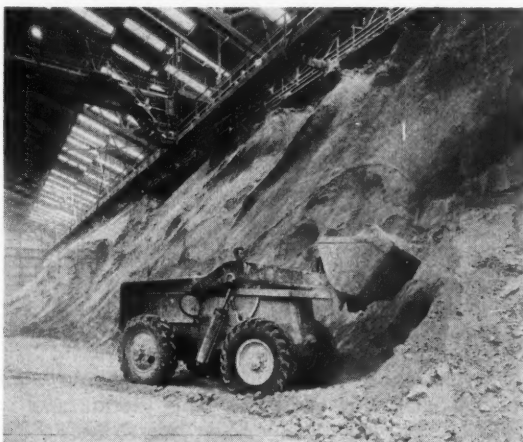
Grinding of a considerable portion of the phosphate rock production is carried out in large mills as a service to some customers. Ground or pulverized rock is necessary in many of the chemical industries as well as for direct application to the soil.

The salable grades of phosphate rock will run between 65 and 77 per cent BPL, and the current

The scooped out phosphate matrix is slurried in water by hydraulic pumps under tremendous pressure for transport to the classification site.

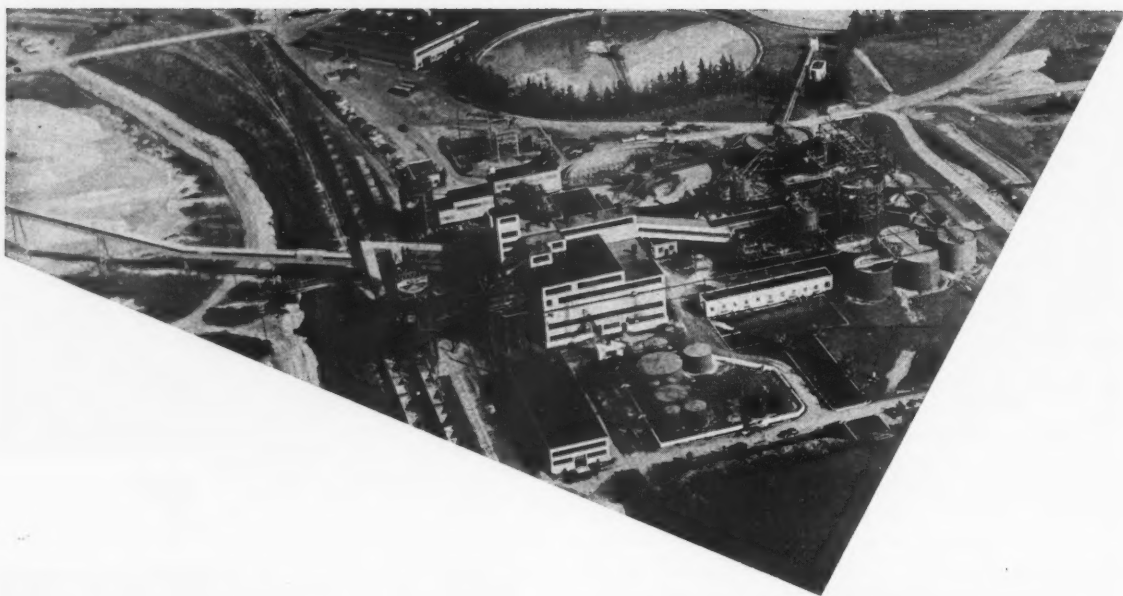


This mammoth dragline, which began operation in 1954, is the largest in the world. International Mineral and Chemical Corporation's "Super Scooper" has a 235-foot long boom from which is suspended a scoop capable of swallowing 84,500 pounds of ore at each bite.



An interior view of the triple storage shed at the Bonnie plant near Bartow, Florida. Here triple superphosphate is stored and cured before shipping.





price for the best grade, 77 BPL, at \$7.65 per long ton, is cheaper in most cases than dirt.

► A considerable portion of the phosphate rock produced is used in the area for the manufacture of triple superphosphate, feed phosphate supplements, and elemental phosphorus. The largest tonnage is consumed in the manufacture of triple superphosphate. The estimated production of triple superphosphate in the United States is on the order of 2,300,000 tons per year. This Florida area will shortly have a production capacity of 1,600,000 tons per year. Basically, the process for the production of triple superphosphate consists of the acidulation of phosphate rock with sulfuric acid and the resultant conversion of the phosphate in the rock to phosphoric acid with the elimination of the calcium and sulfate values as gypsum, which is discarded. This phosphoric acid is then reacted with more phosphate rock to form the triple superphosphate.

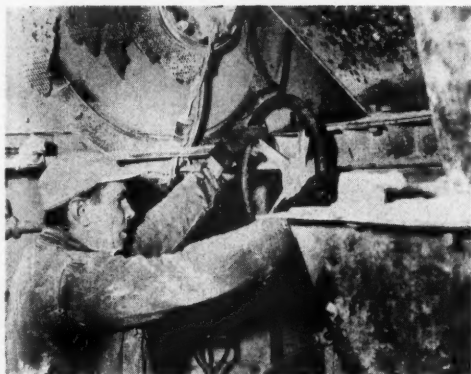
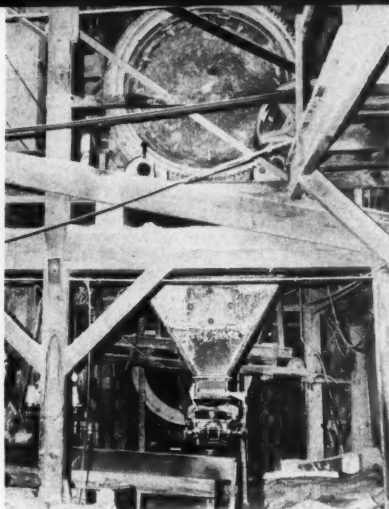
Triple superphosphate is produced in both the run-of-pile and granular forms and is shipped largely in bulk. Large storage area requirements are a factor in this operation because of the seasonal nature of the sales. In recent years a very considerable expansion in production facilities for the manufacture of triple superphosphate has taken place in the Florida area, largely due to the increase in demand for more concentrated plant food.

Material adopted from a paper presented at the Symposium on Mineral Nutrition held at Lakeland, Florida.



Aerial view of the largest phosphate producing operation in the United States—International's Noralyn Mine located near Bartow, Florida. Here the mined rock is refined and classified for shipment. (top)

An interior view of the Noralyn Mine showing the spirals which function in separating phosphate rock and sand and clay impurities.

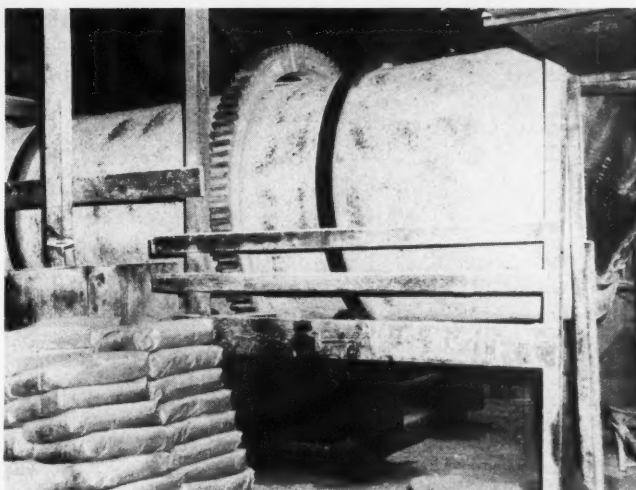


1. Overall view of blending operations.
2. Close-up of mixer which has been in operation for close to 27 years.
3. Operator introduces nitrogen solution into fertilizer dry ingredients as they enter mixer for intimate blending.
4. Blended fertilizer is carried to cooling operation by belt conveyor.
5. Cooling and curing. Blended material enters drum at high temperature, leaves unit at a temperature about 20° F. cooler.

THE Long Island Produce and Fertilizer Company, with its main plant and offices in Riverhead, Long Island, produces high-grade fertilizer primarily for the Suffolk County market. And the mixing and bagging of the fertilizer is scheduled carefully so that it continues ten months a year, minimizing the seasonal layoffs that once were the plague of the fertilizer industry.

When potatoes are being planted in April, it is often necessary to work round-the-clock, processing 25 tons of fertilizer an hour in the Riverhead plant. September and October are the slowest months of the year for the company, and most major plant maintenance occurs at that time.

**ENGINEERED
FOR
EFFICIENCY**



The LIPFC Riverhead operation was engineered and installed in the early 1930's by Sturtevant Mill Company of Boston, Mass.

Since that time a one-ton capacity rotary dry batch mixer has been operating efficiently with a minimum of maintenance. Prior to 1943, it was used primarily for bagging operations; since then, however, it has been utilized in the careful blending of fertilizer constituents with nitrogen solutions.

Three years ago, the first major maintenance problem on this Sturtevant mixer occurred—the inner drum, corroded and abraded beyond recall, was replaced. Aside from this action, only minor parts have needed repair. Scoops, which cascade the fertilizer components in a 180° arc, have needed intermittent replacement.

William Howland, plant superintendent, commenting on the plant operation, said the company has received "30 years of cooperation from Sturtevant. They never have refused to help when problems occur, and you know how many problems come up dealing with this stuff."

Here's how the plant operates:

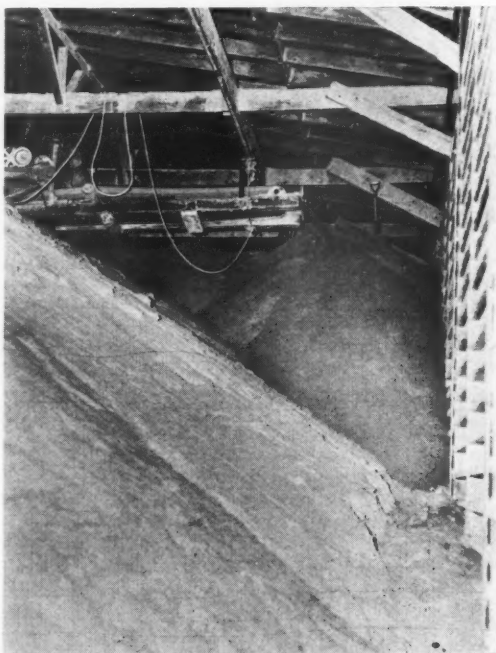
► Ingredients come to the plant siding by rail or by truck from sources in New Jersey, Pennsylvania, Virginia and New Mexico. They are delivered, a ton batch at a time, to a bucket elevator, and are lifted two and a half stories to a breaker, thence through a vibrating screen and introduced into the mixer for a two or three minute blending operation, during which nitrogen solution is added. The fertilizer leaves the blending operation at a high temperature and is then channelled through a 25-foot cooler.

► From the cooling operation, the fertilizer is discharged into stockpiles for further storage and curing. After curing, the bulk fertilizer is reclaimed, screened and bagged for direct farm delivery or for branch warehouse storage.

After bagging, fertilizer is stored in warehouses or trucked directly to farms by LIPCO trucks.

► Several formulations are produced to meet the requirements of specific crops. A quality control program is maintained by LIPCO and all fertilizers are inspected by the New York State Department of Agriculture and Markets.

Maintenance and cleaning problems are relatively minor. Corrosion that is inevitable is evident on the outsides of most of the plant units, but this is taken care of by the heavier design of the equipment. As for equipment in the wholly-Sturtevant-engineered plant, Superintendent Howland said: "I wish we had as little trouble with other equipment as we do with the Sturtevant units."



After cooling, fertilizer is conveyed to storage area for curing.



the importance *of* **MAGNESIUM**

NEW attention is being focused on the importance of magnesium as a fertilizer element for vegetables. The reasons for this: Increased recognition of magnesium as vital to plant life. Growing deficiencies of the element in soils of widespread areas. Success in overcoming deficiencies by using quick-acting, water-soluble magnesium. Certified use of water-soluble magnesium to make complete commercial fertilizers.

Plants must have magnesium. The element is required to help give plants their green color and to keep them growing.

The green coloring matter of plants, chlorophyll, contains 2.7 per cent magnesium. Therefore, the element is of fundamental importance in the life process. Other demonstrated functions of magnesium include: Promoting earlier growth and uniformity of maturity in crops. Enabling crops to make better use of other plant foods. Helping seed development. Forming proteins and oils. Increasing resistance to diseases.

Magnesium deficiency is not confined to any single geographical area. Deficiencies are prevalent in such widespread areas as New England, Atlantic Coast and Gulf Coast states, South, Northwest, and even the corn belt of the Midwest.

The important commercial vegetable growing areas of southern New Jersey had only a few farms with obvious magnesium deficiencies five years ago. But, now, magnesium shortages have been identified in soils of approximately 90 per cent of the same farms.

Just a few months ago, the growing importance of magnesium in increasing cotton yields was demonstrated in Mississippi.

There have been mounting reports of magnesium deficiencies in the Midwest corn belt. They include areas in central and southern Indiana, southeastern Illinois, northeast Ohio, and western and southern Michigan.

Excellent results in overcoming deficiencies and in increasing profitable crop yields have been demon-

strated for fertilizers containing quick-acting, water-soluble sulphate of magnesia.

Water-soluble magnesium, applied to soil in a fertilizer compound or separately, becomes available for plant use more quickly than limestone material used to correct magnesium deficiency.

Corn, cucumbers, tomatoes, cantaloupes, potatoes, fruit trees, cotton, and other crops have responded favorably to fertilizers containing sulphate of magnesia.

The Massachusetts Agricultural Experiment Station reported these increased crop yields resulted from the addition of 200 pounds of sulphate of potash-magnesia per acre to a 5-10-10 fertilizer:

Potatoes, 33 per cent; 19 per cent, and 20 per cent; carrots, 26 per cent; silage corn, 56 per cent; and field corn, 10 per cent.

Three years of field tests by Dr. Ora Smith of Cornell University, Ithaca, N. Y., showed that soluble magnesium gave profitable increases in yields of U. S. No. 1 potatoes.

Potatoes fertilized with 1,200 pounds per acre of 5-10-10, in which the potash was derived one half from muriate of potash and one half from soluble sulphate of potash-magnesia, produced as many bushels as from 2,400 pounds of 5-10-10, in which the potash came entirely from muriate of potash.

The addition of magnesium sulphate or other suitable magnesium material to fertilizer used in Mississippi land with a high calcium content resulted in yield increases of from 250 to 500 pounds of seed cotton per acre.

Tests showed that a "complete" corn fertilizer produced corn yields of 102.7 bushels per acre, but the yields increased 9 per cent to 111.8 bushels an acre when magnesium was added to the fertilizer.

Magnesium is believed to help plants utilize phosphorus. In field tests of peas near Waupun, Wis., parts of fields received fertilizer containing water-soluble magnesium. Analyses of the peas produced showed a consistent increase of magnesium and phos-

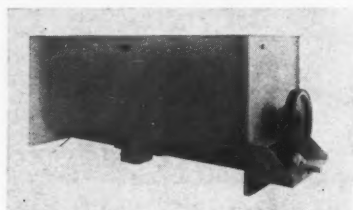
(Continued on page 68)

FARM CHEMICALS

Equipment & Supplies

ROLLER CHAIN DRIVE ON MARION MIXERS

Rapids Machinery Co.'s line of 1957 Marion Horizontal Feed Mixers now is available with an



optional roller chain drive. The regular gear drive is also available.

The manufacturer says the roller chain drive provides a silent, efficient and easily maintained drive. It can also be obtained in a conversion kit for present Marion Mixer users.

Full information and free literature is available if you

CIRCLE 240 ON SERVICE CARD

FLUOPACKER PACKS WIDE RANGE OF PRODUCTS

Corn flour, fly ash, insecticides, magnesium oxide, phosphates, resins, sulfur and dried skim milk—these are indicative of the wide range of products which can be packed successfully by the Fluopacker Filling Machine, reports St. Regis Paper Co.

Compressed air at low pressure is introduced through an air pad at the bottom of a conditioning chamber, surrounding the particles of material at the base of the chamber and making them buoyant or fluidized.

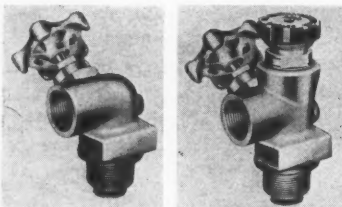
The weight of the material in the conditioning chamber and supply bin above creates pressure on these fluidized particles and ejects them through a filling tube into the bag. This "head" of material required can vary from 6 to 18 feet depending upon

the characteristics of the product.

St. Regis is the exclusive sales and service representative of Food Machinery and Chemical Corp., originator and manufacturer of the Fluopacker Filling Machine.

MULTI-PURPOSE VALVES FROM BASTIAN-BLESSING

Two new Multi-Purpose Valves, the A8017 Series and A8018 Series are now being produced by Bastian-Blessing Co. for use on anhydrous ammonia field storage and nurse tanks.



Design features include an exclusive V-ring pressure seal on a stainless steel stem, positive shut-off, extra large openings to reduce pressure drop and rugged ductile iron bodies. The tank connection on the valves is 1-1/4 inch NPT; side outlet connection is 1 inch NPT and port diameter, 1 inch.

For further data on RegO Anhydrous Ammonia Equipment

CIRCLE 241 ON SERVICE CARD

CLARK TELESCOPING FORK TRUCK UPRIGHT

A three-section, telescoping fork truck upright that raises to permit ceiling-high stacking and retracts low enough to pass through boxcar doors has been announced by the Industrial Truck Div. of Clark Equipment Co.

Named the "triple lift upright," the device is available in



four standard sizes and at additional cost in seven optional sizes. In the smallest size, maximum fork height is 126 inches. When forks are lowered, the overall height of the fork truck is

only 65 inches.

In the largest upright size, maximum fork height is 216 inches and overall height with forks lowered is 96 inches.

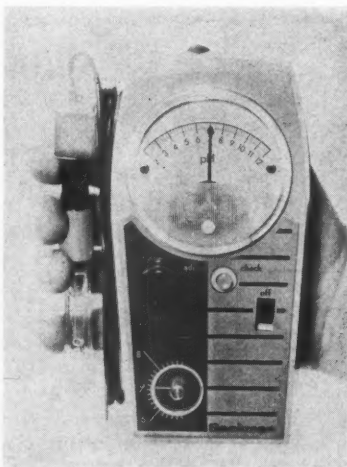
Clark reports the triple lift upright was designed particularly for installations where fork trucks must pass through low doors or areas with low overhead clearance and yet stack loads to considerable heights.

Details may be obtained by

CIRCLING 242 ON SERVICE CARD

POCKET pH METER AIDS FERTILIZER SALESMEN

The Pocket pH Meter is ideal for fertilizer salesmen, farmers, florists and gardeners who need quick on-the-spot information on soil pH, reports its maker, Scientific Instruments Div. of Beckman Instruments, Inc.



The meter features unique combination glass and reference electrode, and is powered by six easily-replaced flashlight-type batteries. It is 6" long, 3" wide,

FARM CHEMICALS

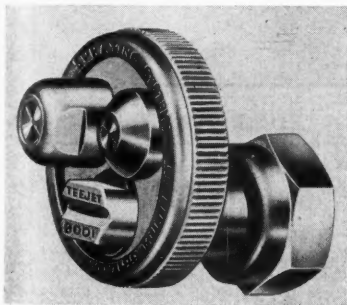
2" deep and weighs only 2 lbs. Range is 2 to 12 pH, readable to .1 pH.

More information is yours if you

CIRCLE 243 ON SERVICE CARD

ADJUSTABLE NOZZLE GIVES CHOICE OF SPRAY PATTERN

The new No. 7199 Multeejet Tip Assembly for use with portable spraying equipment is adjustable to give a choice of flat spray, solid stream or cone (misting) spray, reports Spraying Systems Co. With the nozzle assembly, the user can obtain the three basic types of spray patterns normally required in spray-



ing. The turret head indexes to each position for quickly and accurately setting at operating location, the manufacturer reports.

For complete information,
CIRCLE 244 ON SERVICE CARD

SHEETS FOR TANK LINING AND ABRASION CONTROL

Chemical Coatings and Engineering Co., Inc., has introduced a line of neoprene, natural rubber and Hypalon sheet designed for tank lining and abrasion control problems. The materials are said to combine excellent chemical resistance with good handling and storage characteristics in either vulcanized or unvulcanized form.

For complete information,
CIRCLE 245 ON SERVICE CARD

Suppliers' Briefs

Beckman Instruments, Inc.

Anthony M. Johnson has been named product line sales manager, Systems Div., and Robert J. Baumann, director of marketing, Scientific Instruments Div.

Clark Equip. Co.'s Industrial Truck Div. has named four district sales managers: Marvin B. Dickey for a midwest district covering Detroit and Grand Rapids, Mich., South Bend, Ind., Toledo, O., and Toronto, Ont.; Earl F. Patterson for a northeast district covering New England, Albany, Syracuse and Buffalo, N. Y., and Montreal, P. Q.; William C. Portman of an east central district covering Ohio, Pennsylvania, West Virginia and Virginia and R. W. Self of a midwest district covering Minneapolis, Minn.; Davenport and Des Moines, Iowa, Omaha, Neb., Kansas City and St. Louis, Mo., and Evansville and Indianapolis, Ind.

Davidson-Kennedy Associates Co. announces appointment of H. M. Betzig as vice president—engineering.

Dorr-Oliver Inc. Anthony Anable has rejoined the staff as manager of the Technical Data Div. with headquarters at Stamford, Conn.

Eastman Chemical Products, Inc. is offering a new custom processing plan for the production of industrial chemicals on a commercial basis. The services will be handled at the Kingsport, Tenn. facilities of Tennessee Eastman Co.

The Frank G. Hough Co. New purchasing agent of the firm is Howard B. Casper, former assistant purchasing agent.

In the financial section, Robert L. Smith has been elected secretary and treasurer; Frank M. Docauer, assistant secretary and Fenton O. Richards, controller.

NATIONAL CAL-MAG OXIDES



MgO 40.39
CaO 58.07
TNP 203.88

Superior for Dehydrating, Neutralizing, and Curing factors in the preparation of effective fertilizers.

PROMPT SHIPMENTS

Three railroads serve our Carey, Ohio, plant — assuring prompt delivery—everywhere.

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DOLOMITIC
HYDRATED
LIME (165 TNP)
and
KILN DRIED
RAW DOLOMITIC
(107 TNP)
Screened to size

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LIME and STONE CO.
General Offices
FINDLAY, OHIO

Suppliers Briefs (Continued)

Kraft Bag Co. Robert T. Smith has joined Kraft as sales engineer for Alabama and Western Tennessee. He will operate out of Birmingham, Ala., replacing R. A. Kurlander who is being transferred to the company's New York office to cover New York State and New England area. R. F. Hobbs has been named to the sales staff to handle sales in Northern Ohio and Michigan, working out of the Chicago office.

St. Regis Paper Co. Robin G. Swain, manager of the Western District, Multiwall Packaging Div., died Sunday, June 23. Mr. Swain, who was 54 years old, had been with St. Regis on the West Coast since 1928.

Roger Williams Technical & Economic Services announces that its Latin American subsidiary of the same name has opened offices in Habana, Cuba, at 906 Edificio de Arquitectos, Humboldt y P. Vedado.

FOR SALE: Two Compartment Aluminum Tank Truck. 610 Gal. Capacity. New Power Take Off Pump. Half Bed on Truck behind Tanks. New Tires and Motor. Ready to use—\$1250.00. Two additional used 305 Gal. Aluminum Tanks Not Mounted—\$150.00 each. Schroeder's Nursery, 1081 Duncan Ave., Chattanooga, Tenn.

CLASSIFIED ADVERTISING

NEW RATES...

Effective July 1 1957

Help wanted, positions wanted, used machinery and business opportunities are now charged at only 15 cents per word, \$2.50 minimum. Count box number as five words.

Display ads... \$18.00 per col-

umn inch, minimum of one inch. Ads over the minimum are accepted only in multiples of one half inch.

For prompt results, send your classified ads to Farm Chemicals, 317 N. Broad St., Philadelphia 7, Pa.

Closing date: 10th of preceding month

FOR SALE

Complete set of equipment for manufacturing and bagging fertilizer. Including 1 ton Stedman mixing unit, 400' 20" belt conveyor, 2 Hough payloaders, payloader scales, bagger, sewing machine, conveyors to loading dock, etc. All equipment is now in operation and is standard in every respect—not "Rube-Goldberg." Many more items too numerous to mention. All for \$12,000. Will finance. Address "610" care FARM CHEMICALS, 317 N. Broad St., Phila. 7.

FOR SALE

FOR SALE: Ribbon Mixers 56 to 336 cu. ft.; Hammer Mills 20 to 75 HP; also glass lined tanks, dryers, etc. Perry Equipment Corp., 1430 N. 6th St., Philadelphia 22, Pa.

FOR SALE: Louisville 8-Roll 36" Dewatering Presses; 24,000 gal. Aluminum Tank; Louisville Steam Tube Dryers 4' x 30', 6' x 30' & 6' x 45'. Perry Equipment Corp., 1430 N. 6th St., Philadelphia 22, Pa.

HELP WANTED

WANTED: Experienced fertilizer man for Upper Midwest State. Must have background of successful production management. In reply state qualifications. Address "625" care FARM CHEMICALS, 317 N. Broad St., Philadelphia 7.

WANTED TO BUY

WANT TO BUY: 1 ton Fertilizer Mill preferably a Stedman. Other machinery in good condition for a fertilizer plant. Address "620" care FARM CHEMICALS, 317 N. Broad St., Philadelphia 7.

City of Baltimore HEAT-DRIED SLUDGE a good, low-cost organic conditioner

AVAILABLE IN BULK CAR OR TRUCK LOTS

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MONARCH SPRAYS



This is our Fig. 645 Nozzle. Used for Scrubbing Acid Phosphate Gases. Made for "full" or "hollow" come in brass and "Everdur." We also make "Non-Clog" Nozzles in Brass and Steel, and

Stoneware Chamber Sprays now used by nearly all chamber spray sulphuric acid plants.

CATALOG I

MONARCH MFG. WORKS, INC.

2501 East Ontario Street, Philadelphia 34, Pa.

CHEMICALS

DIAZINON NOW APPROVED FOR FRUIT

Geigy Agricultural Chemicals, Div. of Geigy Chemical Corp. has announced that Diazinon insecticides are now approved for use on fruit.

Diazinon controls practically all major fruit pests on apples, pears and cherries, Geigy reports. It may be applied up to 14 days before harvest on apples and pears and up to 10 days before harvest on cherries. Residue tolerance is 0.75 ppm.

NEW LABEL CLAIMS FOR GLYODIN FUNGICIDE

Three new label claims are being made for Glyodin by the manufacturer, Union Carbide Chemicals Co., Div. of Union Carbide Corp. These statements summarize the claims: (1) Glyodin gives lasting protection against apple scab even through prolonged rainy periods. (2) Glyodin leaves an almost invisible residue on leaves and fruit. (3) Glyodin does not injure honeybees.

V-C TEST MARKETS NEW FOLEX COTTON DEFOLIANT

Virginia-Carolina Chemical Corp. has a new cotton defoliant which is reported to give dependable defoliation regardless of weather or rankness of cotton. Tradenamed Folex, the product will be test marketed in Mississippi, Arkansas, Arizona and California this season.

The product contains merphos (tributyl phosphorotrithioate) which was developed by V-C research personnel. Frank Boyd, the company's southern agronomist, said the defoliant does not depend upon dew for activation and removes immature as well as mature leaves from the plant. Boyd added that no special equipment is required for Folex, because the chemical is non-corrosive.

The defoliant is a liquid concentrate which mixes readily with water. It can be added to the spray tank and by the time the

tank is filled with water, mixing is complete. V-C reported that as little as one pint per acre has given acceptable defoliation.

TRITHION IS GRANTED REGISTRATION BY USDA

Trithion, the organic phosphate insecticide and acaricide developed by Stauffer Chemical Co.'s research laboratories, has been granted registration by USDA for mite and insect control for non-residue uses on a number of crops. Previously the compound, chemically O,O-Diethyl S-p-chlorophenylthiomethyl phosphorodithioate, had been sold only on an experimental basis.

Use of Trithion is now permitted for the control of mites, aphids and certain other insects on these crops:

Post harvest use on deciduous orchards—apple, peach, pear, plum, prune and nectarine; cotton; seed crops; beans (dry, shelled); and almonds.

SOIL FUMIGATION SPEEDS CITRUS GROWTH

These lemon trees show how much soil fumigation can speed citrus growth by controlling soil fungi and nematodes. Both trees are the same age, were planted at the same time. Before planting, however, the soil in which the tree at the right was set out was fumigated with Stauffer Chemical Co.'s Vapam. The other tree was planted alongside, but in untreated soil.

Appraising the difference are James Cleveland, Campbell & Sloop Ranch; Marvin Miller, farm advisor, Riverside county; Dr. Richard C. Baines, plant nematologist, and Thomas A. DeWolfe, Dept. of Plant Pathology, Citrus Exp. Station, University of California.



PLANT NUTRIENTS HAVE VARYING EFFECT ON DIFFERENT CROPS

Soils research workers have more evidence that fertilizers don't affect all crops the same way.

In trials on fields in northeastern Minnesota, oats needed phosphorus more than any other nutrient. Potatoes needed potassium most, and hay yields were boosted most by phosphate and potash together.

These reports come from A. C. Caldwell, University of Minnesota soils scientist, and W. W. Nelson, agronomist at the Northeast Experiment Station, Duluth.

Last summer, they tested applications of nitrogen, phosphate, and potash, alone and in combination, on oats, potatoes, and hay.

Unfertilized oats averaged 16.4 bushels per acre. Plots that received phosphate alone yielded 43 bushels—nearly 6 bushels higher than oat plots receiving both phosphate and potash and only a bushel lower than plots that received complete fertilizer.

In hay, the best increase came from adding both potash and phosphate, but potash was the most limiting nutrient. Unfertilized first-year hay plots averaged about 2 tons per acre, while plots receiving potash alone averaged 3.06 tons. Potash and phosphate together brought yields up to 3.16 tons per acre, but first-year plots receiving all three nutrients actually averaged lower yields—2.77 tons—than potash-phosphate plots.

Results were similar in second-year hay, except that adding nitrogen in complete fertilizer did help some in this case. Nitrogen alone, though, made no increase.

Potato yields were highest, the researchers reported—304 bushels per acre—on land that received nitrogen, phosphate and potash, but potash made more difference than any single nutrient. Unfertilized potatoes averaged 74 bushels per acre, compared to 155 where potash alone was added. Phosphate alone brought yields of 87 bushels per acre and nitrogen alone brought no yield increase at all in potatoes.

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by Dr. Melvin Nord

PATENT REVIEWS

FERTILIZERS

U. S. 2,783,139, issued Feb. 26, 1957 to Richard C. Datin and assigned to Allied Chemical & Dye Corp., describes a process for the production of ammoniated superphosphates containing citrate-soluble P_2O_5 which has little or no tendency to revert to the citrate-insoluble form, and containing at least 1.3 mols of ammonia per mole of P_2O_5 .

The acidulation of the phosphate rock is carried out in the presence of sodium ion, and the superphosphate thus produced is then ammoniated. It is believed that the sodium blocks the formation of fluorapatite.

U. S. 2,783,140, issued Feb. 26, 1957 to Travis P. Hignett, Milton R. Siegel, Robert S. Meline, and Thurman M. Kelso, assigned to Tennessee Valley Authority, describes a process for the production of fertilizers from high-alumina phosphate ores, such as the "leached zone ore" layer of Florida phosphate deposits.

The ore is calcined at 800–1200° C., crushed, extracted with nitric and/or sulfuric acid, followed by ammoniating the liquid after removal of the insoluble residue, granulating the mixture, and drying the granules.

U. S. 2,784,530, issued March 12, 1957 to John Warren Dugan and assigned to Flo-Mix Fertilizers Corp., describes a method of mixing ammonia with water and introducing the mixture into the soil.

IMPROVING APPLE COLOR

U. S. 2,784,070, issued March 5, 1957 to Eric C. Cameron and Verle W. Woods, assigned to Woods Industries, Inc., provides a means of improving the coloration of apples.

The vapors and gases evolved by apples placed in storage are

collected and passed through a bed of activated carbon, until the bed is saturated. The vapors are then recovered by steam distilling the activated carbon, and condensing. A light fraction of non-water soluble liquid rises to the surface of the water, and is decanted. A fractional distillation is then performed, recovering the fraction boiling between 75 and 175° C. This liquid is dissolved in denatured alcohol and spread on the foliage and apples on the tree.

HERBICIDES

U. S. 2,784,071, issued March 5, 1957 to John A. Garman and Donald K. George, and assigned to Food Machinery & Chemical Corp., discloses the use of 2-(1-chlorophenyl) N-(3-chlorophenyl) carbamate as an herbicide.

U. S. 2,784,072, issued March 5, 1957 to John A. Garman and Walter P. Brian, assigned to Food Machinery & Chemical Corp., discloses the use of 2-(1,3-dichloropropyl) N-phenylcarbamate as an herbicide.

U. S. 2,785,967, issued March 19, 1957 to William T. Dye, Jr., assigned to Monsanto Chemical Co., disclose the use, as herbicides, of benzyl-tris (dialkyl-amino) phosphonium halides.

U. S. 2,785,968, issued March

19, 1957 to Milton Kosmin and assigned to Monsanto Chemical Co., discloses the use of esters of 2-sulfoethanol and a chloroalkanoic acid as herbicides.

PESTICIDES

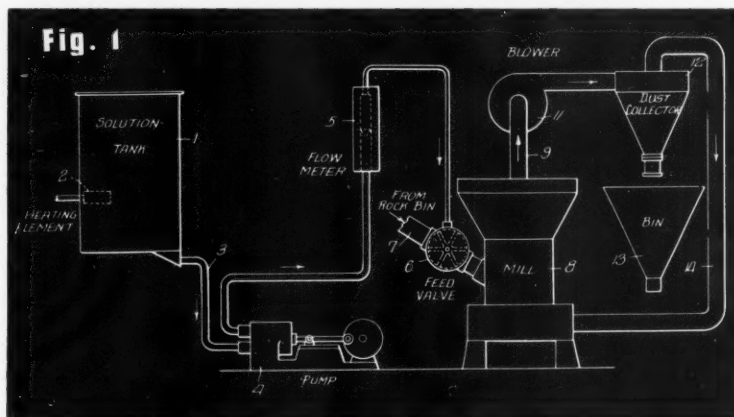
U. S. 2,784,136, issued March 5, 1957, to Gerarda F. E. M. Dierick, Christian P. van Dijk, and Franciscus J. F. van der Plas, assigned to Shell Development Co., discloses the use, as an insecticide, of a liquid copolymer of octene-1 and allyl acetate. The polymer has substantially no phytotoxicity when applied to plants in concentrations sufficiently high to destroy insects and their eggs.

U. S. 2,784,138, issued March 5, 1957 to Richard Wegler, Ferdinand Grewe, and Erik Regel, assigned to Farbenfabriken Bayer A. G., discloses the use of N-aryl-hydroxy-arylmethylamines as fungicides.

U. S. 2,784,140, issued March 5, 1957 to Edward Broderick, assigned to Rohm & Haas Co., describes an emulsifier composition for use in the preparation of oil-in-water emulsions containing insecticides.

The addition of a small amount of methanol to an emulsifier of the alkaryl ether type hinders the breakdown of the emulsifier in the presence of chlorinated bicyclic terpenes.

U. S. 2,785,101, issued March 12, 1957 to Ewald Urbschat and Paul-Ernst Frohberger, assigned to Farbenfabriken Bayer A. G., discloses the use of quinone oxime acyl hydrazones for rendering grain immune against attack by fungi.



... PATENTS

U. S. 2,785,102, issued March 12, 1957 to Waldo B. Ligett, Rex D. Closson, and Calvin N. Wolf, assigned to Ethyl Corp., discloses the use of mono- and di-substituted 1,2,4,5-tetrahydropyridazine-3,6-diones as fungicides.

U. S. 2,786,009, issued March 19, 1957 to John A. Pianfetti, Oren F. Williams, and James F. Allen, assigned to Food Machinery & Chemical Corp., discloses the use of carbonyl bisdithio-

phosphate compounds as acaricides and insecticides.

U. S. 2,786,011, issued March 19, 1957 to Leo J. Novak and assigned to The Commonwealth Engineering Co. of Ohio, describes a method of producing highly concentrated, stable dispersions of solid, particulate pest controlling agents. The particulate active agent is dispersed in water containing, as the dispersing aid, a very small amount of carboxymethyl dextran.

U. S. 2,786,012, issued March 19, 1957 to Brack B. McHan and assigned to Calcium Carbonate Co., provides a method of producing a calcium carbonate carrier for insecticides, which avoids the problems of caking and lumping. Other advantages claimed for the product include improved stability, and improved uniformity of distribution because the electrical charge on the dust particles causes the dust to be attracted to the plant foliage.

As shown in Fig. 1, a water emulsion of distilled rosin acid is pumped from tank 1 to a feed valve 6 located in the conduit 7 which carries crushed limestone rock from the rock bin to the mill 8. The pulverized rock passes to a dust collector 12, and the pulverized material passes to a bin 13, while the air is returned to the mill through pipe 14.

U. S. 2,786,013, issued March 19, 1957 to Robert W. Behrens, assigned to Atlas Powder Co., describes emulsifier compositions for insecticides, containing toxaphene as the active ingredient, a hydrocarbon diluent, and a mixed emulsifier consisting of a lauric acid amide of an anhydridized methyl glucamine and an ester of an ether-alcohol.

TOBACCO DESUCKERING COMPOSITIONS

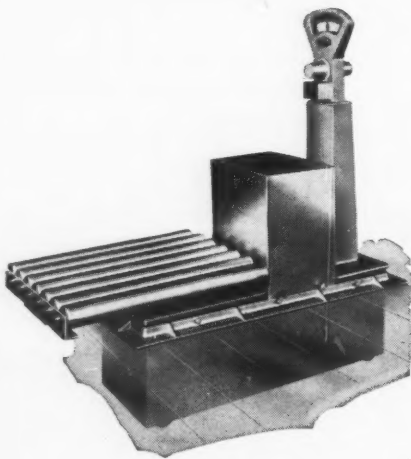
U. S. 2,772,152, issued Nov. 27, 1956 to Robert E. Emond and Warren C. Pattenden, assigned to Esso Research and Engineering Co., describes grease and paste compositions for desuckering tobacco and increasing yield.

The active agent of the paste or grease is a white oil having an SUS viscosity in the range 150-350 SUS at 100° F and having an ASTM unworked penetration of 150 to 420. The paste is made by co-reacting stearic acid, lye, and the white oil.

The suckers are killed by applying the desuckering agent just below the exposed surface of the freshly "topped" tobacco plant. The killing action seems to take place after it runs down the stem and reaches the active sucker tissue.

Scales for Sacking and Checkweighing

MODEL 2229—Designed for overhead suspension. One man can bag, weigh and checkweigh in one simple operation. Has just two controls—easy to operate. Save labor costs and eliminate over-weights with an Exact Weight Sacking Scale.



MODEL 1302-R—Checkweighing scale fits right into your production line. Precision checkweigher for open end or valve type bags. Fast acting, accurate, easy-to-read. Trims seconds off each weighing operation.

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PEST REPORTS

BORER COUNTS HIGH IN SEVERAL AREAS

BY THE first of July the European corn borer situation was rather spotted. Missouri reported the highest numbers that had been recorded for several years. The situation was ideal for heavy second- and third-generation damage in the southeastern part of the state. The European corn borer has been of economic importance in Alabama only in recent years but reports state that the insect was severe in corn in the northern part of the state by late June.

Illinois had egg mass counts of 100-400 per 100 plants in early fields by the first of July. Maximum egg counts in the Perry, Iowa area were 500-700 per 100 plants. Light to moderate populations were reported from Pennsylvania, Ohio, Indiana, Wisconsin, Minnesota and South Dakota. Some early damage was reported from Delaware and New Jersey.

Grasshoppers have been abundant in some areas. Severe infestations were present in cropland in Sheridan, Roosevelt, Daniels, Richland and McCone counties, Montana and there are heavy populations on the range in many parts of the state. North Dakota reported in early July that the pests were the major insect threat to crops in that state. About 80,000 acres of rangeland were scheduled for cooperative control in the state at that time also. Populations were threatening to severe in several local areas of north central Kansas and continued to increase in Utah where controls were carried out on over 33,000 acres. Cooperative control is underway on an aggregate of about 300,000 acres in Wyoming.

Among fruit pests, mites were perhaps the most active. By the

first of July increases were noted in the Carbondale area of Illinois and the Vincennes area of Indiana. Spotted heavy populations were noted in Maryland and in southeastern and south central Pennsylvania. Rapid buildup of the pests was reported from Orleans and Niagara counties, New York.

Of particular interest to the citrus industry was the finding, in early July, of five adult Mexican fruit flies in southern California all near the Mexican Border. These were the first specimens of the pest trapped in California since the summer of 1956. Late in June, flies were trapped at Tijuana, Baja California. Ten flies, the first catch for this year, in that area were taken during the month. By the last of the month the 43rd spray application for control and eradication of the insect was underway on the Tijuana side of the border and about 60 such applications had been made in the southern California area.

BOLL WEEVILS A THREAT IN SEVERAL AREAS

Weather through June and early July was favorable for boll weevil development throughout a large portion of the area where this insect occurs. The weevil was a serious threat in many of the 18 North Carolina counties reporting. Counts in untreated fields ranged from 3 to 80 per cent. South Carolina which had reported serious potentials early in the season recorded infestation increases over the entire cotton-growing area of the state by July 1. Punctured squares were numerous in Georgia with counts in 31 fields in 10 counties in the

Presented in cooperation with the Economic Insect Survey Section, Plant Pest Control Branch, Agricultural Research Service, USDA.

northern sections of the state averaging 31 per cent. In the middle and southern parts of the state the average was 20 per cent punctured squares. Five southeastern Alabama counties had an average of 32 per cent punctured squares in a count made the latter part of June.

Although boll weevil infestations were relatively light in Mississippi in June, control work was under way. Counts during early July in 25 delta fields showed an average of approximately 7 per cent punctured squares. In Madison Parish, Louisiana, punctured square counts in 40 untreated fields averaged 27 per cent and in 35 treated fields 18 per cent.

Conditions in Tennessee in late spring were favorable for a buildup of boll weevils. Overwintered weevils were active and punctured square counts by early July in the southern tier of counties averaged 31 per cent. In Arkansas, weevil activity was below the same period last season. Checks in late June showed a few first-generation weevils appearing in the southeastern part of the state. Of the fields examined, 26 per cent showed infestation, compared with 50 per cent last year. By early July migration was under way in the lower Rio Grande Valley area of Texas and considerable boll damage was reported. Infestations were light in the coastal bend, south central, east and central areas. In the southwestern area infestations ranged from light to medium.

Although cotton bollworms required control in some areas during late June and early July they were generally light. In west Tennessee some controls were applied as was the case in Mississippi. Alabama reported light to medium infestations with the exception of Autauga county which was classified as heavy. Arkansas, Texas and Georgia had light infestations. Bollworms were on

... PESTS

the increase in Hampton and Marlboro counties, South Carolina but populations were light in the Piedmont and Coastal Plains areas.

OTHER INSECT ACTIVITY

By the first of July the Japanese beetle was very active. In Virginia the insect was causing more concern than any other pest and in Maryland it was more abundant than normal in most sections. Delaware also reported greater abundance than usual. Several heavy infestations were present in North Carolina, Georgia, West Virginia and Pennsylvania. The first adult of the year for the East St. Louis, Illinois area was reported June 19.

The potato leafhopper was causing concern in late June and early July in several sections. The insect was building up on alfalfa, potatoes and beans in areas of Pennsylvania as well as in Delaware and Maryland. In parts of Illinois counts in alfalfa of 500-6,000 adults and 300-8,900 nymphs per 100 sweeps were recorded. Populations requiring control were present in Wisconsin

and damage was reported from Iowa and Missouri.

The cooperative Federal, state and local gypsy moth spray program in the Northeastern states for this season was completed in late June. A total of approximately 3,500,000 acres was sprayed during the season with the greater part of the spraying as follows: New York—2,779,000 acres; Pennsylvania—236,000 acres; New Jersey—193,000 acres; and Massachusetts—120,000 acres. The work this year was part of the long range program to eradicate the pest from this country.

Cooperative eradication spraying was also conducted on nearly 19,000 acres in the Lansing, Michigan area.

COPPER SULFATE SHIPMENTS UP 14%

Copper sulfate shipments in April rose 14 per cent over March, and were the largest since March, 1953, according to the Bureau of Mines, United States Department of the Interior.

Production was reported to have increased 7 per cent in April but was 1,100 tons less than

STATISTICS

shipments, and stocks decreased 27 per cent. Inventories were the lowest since March, 1956, amounting to less than two weeks' requirements at the April shipment rate.

SUPER SHIPMENTS DOWN FROM MARCH

Shipments of superphosphate and other phosphatic fertilizers during April totaled 224,048 tons, or a decrease of 7 per cent from the volume shipped during the previous month, according to the Bureau of the Census, U.S. Dept. of Commerce.

Stocks held by producing plants as of April 30 totaled 234,994 tons, or 27 per cent less than those held on March 31, 1957.

AGRICULTURAL LIME SALES UP IN MARCH

During March, sales of agricultural lime by producers totaled 24,826 short tons, according to the Bureau of Mines. This compared with 19,605 tons sold for the same period of 1956.

Sales during the period January through March, 1957, were reported to be 43,785 short tons.

Production — April, 1957

Compiled from Government Sources

Chemical	Unit	April		March
		1957	1956	1957
Ammonia, synth. (anhydrous)	s. tons	319,825	306,172	320,733
Ammonia liquor, coal & coke (NH ₃ content)	pounds	2,694,076	2,978,185	3,158,494
Ammonium nitrate, fert. grade (100% NH ₄ NO ₃)	s. tons	193,127	166,683	*201,173
Ammonium sulfate				
synthetic (technical)	s. tons	98,366	92,725	97,834
coke oven by-product (incl. amm. thiocyanate)	pounds	155,853,353	166,068,782	161,496,036
BHC (Hexachlorocyclohexane)	pounds	3,485,121	8,168,008	4,379,199
Gamma content	pounds	608,395	1,328,813	693,343
Calcium arsenate (commercial)	s. tons	1	479	1
Copper sulfate (gross)	s. tons	6,884	6,044	6,424
DDT	pounds	11,766,410	10,966,684	11,522,140
2, 4-D Acid	pounds	2,719,247	2,530,908	2,555,211
ester and salts	pounds	3,192,170	2,597,757	2,581,329
ester and salts (acid equiv.)	pounds	2,417,339	2,033,169	2,138,802
Lead arsenate (acid and basic)	s. tons	832	646	702
Phosphoric acid (50% H ₃ PO ₄)	s. tons	356,352	312,054	380,992
Sulfur, native (Frasch)	l. tons	461,589	504,289	471,548
Recovered	l. tons	37,650	36,200	39,800
Sulfuric acid, gross (100% H ₂ SO ₄)	s. tons	1,360,636	1,362,851	*1,417,538
Superphosphate (100% APA)	s. tons	224,997	*229,529	*229,529
Normal and enriched (100% APA)	s. tons	139,915	*137,368	*137,368
Concentrated (100% APA)	s. tons	61,337	70,173	70,173
Other phos. fertilizers (incl. wet-base goods)	s. tons	23,745	*22,773	17,201

*Revised Withheld to avoid disclosing figures for individual establishments.

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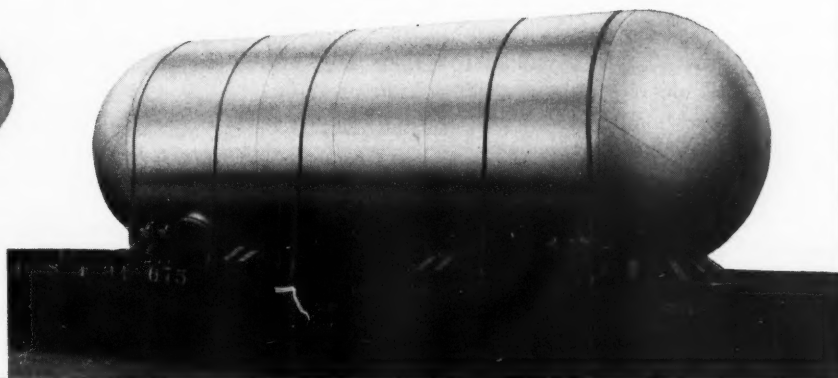
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FERTILIZER MATERIALS MARKET

New York

July 20, 1957

Sulphate of Ammonia. Producers are in a little better position in most cases than a year ago and prices were reported as steady with demand fairly good from most sections. Some export inquiries have recently been turned down for lack of offerings.

Ammonium Nitrate. One new producer was reported in production in the far West where demand is better than in the Central and Eastern States but this is not expected to have much effect on the market. Demand continues fairly good.

Urea. Imported material continues to arrive from time to time but prices are about in line with the domestic market. The supply situation is a little better than 30/60 days ago because the fertilizer season is over in most places.

Nitrogenous Tankage. Some movement was reported in this material to buyers who do some early mixing. Prices in most cases remain unchanged with the market quoted at from \$3.00 to \$4.00 per unit of ammonia (\$3.64 to \$4.86 per unit N) according to shipping points. Demand is considered fair for this time of year.

Castor Pomace. No offerings have been available in sometime from domestic sources. Last sales were made on the basis of \$45.00 per ton, f.o.b. production points. The supply situation does not look good at this time because of lack of offerings.

Organics. With the end the current fertilizer season, trading in organic fertilizer materials was on the slow side with few price changes noted. Tankage and blood last sold at \$5.00 per unit of ammonia (\$6.08 per unit N) f.o.b. Eastern production points. Soybean meal sold as low as \$41.50 per ton, f.o.b. Decatur, Ill. in bulk and the market advanced recently to \$46.00 because of buying by the feed trade.

Cottonseed meal was firm for lack of offerings as most of the old crop meal has been sold. Linseed meal was slightly firmer.

Fish Meal. Fishing operations were rather spotty. In some waters good catches were reported and other boats reported poor fishing. Prices remained about \$125 per ton, f.o.b. fish factory for fish scrap on a "when and if made" basis. Very little imported fish meal was arriving.

Bone Meal. Demand from the feed trade at the present time is rather limited and most fertilizer buyers are waiting to buy until they actually need the material. Last sales on basis of \$60.00 to \$65.00 per ton, f.o.b. shipping points for both fertilizer and feed grades.

Hoof Meal. Steady prices of about \$5.75 per unit of ammonia (\$6.99 per unit N) f.o.b. Chicago were reported for hoof meal with demand coming most from industrial users.

Low Grade Organics. A limited demand was noted for cocoa shells, fillers and other types of low grade organic materials.

Superphosphate. This market was quiet and shipments moving out slowly on contract. No price changes were noted.

Potash. One or two producers have made some changes in their price schedules to conform to reported competition. One producer has a strike at Carsbad, New Mexico. Some offerings were noted of some imported potash at prices slightly under domestic prices.

Philadelphia

July 19, 1957

The raw materials market is quiet with demand probably a bit below normal, and production somewhat reduced. However, contracts are being made in the hope that the situation will improve before the season gets under way.

Sulphate of Ammonia. Demand for this article has been very good for export and fairly so for domestic use. Previous large stocks are being gradually leveled off and the shipping situation is easier. Coke oven grade is quoted at \$32.00 per ton, and synthetic grade at \$34.00.

Ammonium Nitrate. The demand is fair and production and inventories are being gradually reduced. Price presently listed is \$64.00 per ton.

Nitrate of Soda. Situation is without any material change. Material is in ample supply and prices are listed as heretofore: \$43.50 per ton in bulk and \$47.00 bagged for the domestic grade; and \$46.00 bulk and \$49.50 bagged for imported.

Urea. This is quoted at \$110.00 per ton for the 45 per cent nitrogen grade, but supply is reported not too plentiful.

Blood, Tankage, Bone. The market is rather slow with apparently no price changes from our previous report. Blood is quoted at \$5.25 per unit ammonia (\$6.38 per unit N) in New York area, and \$6.00 (\$7.29 per unit N) Chicago. Tankage at \$5.00 (\$6.08 per unit N) New York and \$5.75 (\$6.99 per unit N) Chicago. Fertilizer grade bone meal is more or less nominal at \$60.00 per ton, and feeding grade \$68.00 to \$72.00.

Fish Scrap. Production is reported somewhat down with imports up a little. However, quotations remain the same at \$125.00 per ton for scrap, and \$130.00 per ton for menhaden meal.

Superphosphate. This continues to be quoted at 90 cents to 93 cents per unit A.P.A. for the normal grade, and 98 cents per unit for triple.

Potash. Present quotation is 34½ cents per unit K₂O per ton for muriate and stocks are well able to take care of the demand.

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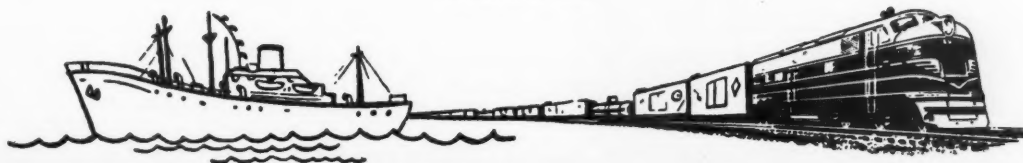
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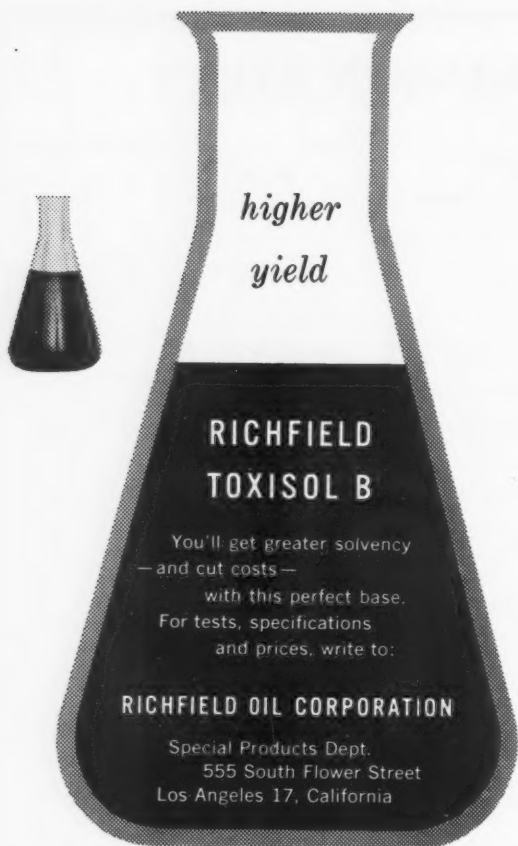
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Fertilizer Situation (Continued from page 45)

capacity and actual production within a few years.

Use of fertilizer-pesticide mixtures was estimated to have been 149,000 tons in 1953-54, an increase of 71 per cent over the previous year. It is expected that definite figures regarding the consumption of these mixtures in 1955-56 will be available this fall when results of a survey by the Soil and Water Conservation Research Division, ARS, will be reported.

Except for 1955-56, in each year since 1937-38 total use of fertilizer has shown an increase. It is expected that the trend toward use of higher analysis materials will continue.

Magnesium (Continued from page 55)

phorus in those that received the water-soluble magnesium. And the yields of peas were greater from the fields receiving the magnesium.

The relationship of the magnesium content of peas to per-acre yield was substantiated in tests near Beaver Dam, Wis. Peas with a high content of magnesium yielded more per acre. The yield decreased as the magnesium content went down.

Cannery pea growers use soluble magnesium and potash to increase yields and quality of peas in the Skagit Valley of Washington state. Soil tests show that at least one farmer of three in the Northwest can profit from the use of magnesium.

The increasing importance of magnesium is further demonstrated by the fact that some Atlantic and Gulf Coast states now require a guarantee of the magnesium content in commercial fertilizers.

Crop growers are recognizing increasingly the profit-making value of magnesium and they want fertilizers containing the element. To help growers, fertilizer manufacturers are including guarantees of magnesium content among analyses printed on bags used for fertilizer.

Some fertilizer bags carry printed seals certifying the inclusion of water-soluble sulphate of potash-magnesia in the plant food combination. This is important because of the need for quick-acting magnesium.

The reasons for the growing practice of adding soluble magnesium to fertilizers include:

1. No longer is soluble magnesium present in appreciable quantities in the highly-refined materials used to make fertilizers.
2. Large acreages of land naturally contain only limited supplies of magnesium. Magnesium and other plant foods need to be added each season.
3. Magnesium contained in some soils does not become available fast enough to offset leaching and crop removal.
4. Bigger crop yields, which result from heavier applications of fertilizer, are depleting the available magnesium at an accelerated rate.
5. Increased ratios of potassium in fertilizer require increased amounts of water-soluble magnesium to permit crops to utilize the potash fully.
6. The addition of water-soluble magnesium can be done at a low cost per ton.

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"The Food and Drug Administration is confident that the pesticide tolerances established under the Miller Bill and the production of food crops in conformity with them impose no hazard on the public health." Frank J. McFarland, Assistant to the Director, Bureau of Biological and Physical Sciences, Food and Drug Administration, U.S. Department of Health, Education and Welfare. (Statement—January 1957)

"These materials (Pesticide Chemicals) were developed because they had the ability to destroy, prevent, repel, or mitigate the activity of insects, weeds, fungi, nematodes, rodents, or bacteria. . . . No one knows exactly what would happen if use of pesticide chemicals on the farm should be abandoned, but it is safe to say that we could not commercially produce apples, peaches, potatoes, citrus and tomatoes, to mention only a few crops; and yields of many others would be drastically reduced. . . . It seems evident that the American people cannot be fed adequately unless crops and livestock are protected from insects and other pests." Pesticides Subcommittee of the Food Protection Committee of the National Academy of Sciences-National Research Council. (Report—November 1956)

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Winton B. Rankin, Assistant to the Commissioner, Food and Drug Administration, U.S. Department of Health, Education and Welfare. (Statement—December 1955)



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Pennsylvania Salt Mfg. Co., of Wash., Tacoma, Wash.

BIN LEVEL CONTROLS

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Stephens-Adamson Mfg. Co., Aurora, Ill.

BIN DISCHARGERS

Stephens-Adamson Mfg. Co., Aurora, Ill.

BONE PRODUCTS

American Agricultural Chemical Co., N.Y.C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackie, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID

American Potash & Chemical Corp., Los Angeles, California
Woodward & Dickerson, Inc., Philadelphia, Pa.

BOX CAR LOADERS

Stephens-Adamson Mfg. Co., Aurora, Ill.

BROKERS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N.Y.C.
Jackie, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BULK TRANSPORTS

Baughman Mfg. Co., Jerseyville, Ill.

CALCIUM ARSENATE

American Agricultural Chemical Co., N.Y.C.

CAR PULLERS

Stephens-Adamson Mfg. Co., Aurora, Ill.

CARS AND CART

Stedman Foundry and Machine Co., Aurora, Ind.

CASTOR POMACE

Ashcraft-Wilkinson Co., Atlanta, Ga.

CHEMISTS AND ASSAYERS

Shuey & Co., Inc., Savannah, Ga.

CHLOROBENZILATE

Geigy Agr. Chems. Div. Geigy Chem. Corp. N.Y.C.

CHLORDANE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Velsicol Chemical Corp., Chicago, Ill.

CLAY

Ashcraft-Wilkinson Co., Atlanta, Ga.

CONDITIONERS

Ashcraft-Wilkinson Co., Atlanta, Ga.
H. J. Baker & Bro., New York City
Jackie, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
National Lime & Stone Co., Finlay, Ohio
U. S. Graphite Co., Saginaw, Mich.

CONVEYORS

Baughman Mfg. Co., Jerseyville, Ill.
Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Finco Inc., North Aurora, Ill.
Joy Mfg. Co., Pittsburgh, Pa.
Stedman Foundry and Machine Co., Aurora, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Sturtevant Mill Co., Boston, Mass.

COPPER SULFATE

Tennessee Corp., Atlanta, Ga.

COTTONSEED PRODUCTS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N.Y.C.
Jackie, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

DDT

Ashcraft-Wilkinson Co., Atlanta, Ga.
Geigy Agr. Chems., Div. Geigy Chem. Corp., N.Y.C.
Monsanto Chem. Co., St. Louis, Mo.

DIAZINON

Geigy Agr. Chems. Geigy Chem. Corp., N.Y.C.

DIELDRIN

Ashcraft-Wilkinson Co., Atlanta, Ga.

DILUENTS

Ashcraft-Wilkinson Co., Atlanta, Ga.

DRUMS—STEEL

Vulcan Steel Container Co., Birmingham, Ala.

DUST CONTROL

Johnson-March, Philadelphia, Pa.

ELEVATORS

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.

ENDRIN

Velsicol Chemical Corp., Chicago, Ill.

ENGINEERS—Chemical and Industrial

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

FERTILIZER—Liquid

Clover Chemical Co., Pittsburgh, Pa.

FERTILIZER—MIXED

American Agricultural Chemical Co., N.Y.C.
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.

FILLERS

Bradley & Baker, N.Y.C.

FISH SCRAP AND OIL

Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N.Y.C.
Jackie, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

FULLER'S EARTH

Ashcraft-Wilkinson Co., Atlanta, Ga.

FUNGICIDES

American Agricultural Chemical Co., N.Y.C.
Tennessee Corp., Atlanta, Ga.

GIBBERELLIC ACID

Eli Lilly & Co., Indianapolis, Ind.
Merck & Co., Rahway, N.J.

HEPTACHLOR

Velsicol Chemical Corp., Chicago, Ill.

HERBICIDES

American Cyanamid Co., New York City
American Potash & Chemical Corp., Los Angeles, California
Monsanto Chem. Co., St. Louis, Mo.

HOPPERS & SPOUTS

Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

IMPORTERS, EXPORTERS

Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

KAOLIN

Thomas Alabama Kaolin Co., Baltimore, Md.

INSECT REPELLENT

Glenn Chemical Co., Inc., Chicago, Ill.

INSECTICIDES

American Agricultural Chemical Co., N.Y.C.
American Cyanamid Co., New York City
American Potash & Chemical Corp., Los Angeles, California
Ashcraft-Wilkinson Co., Atlanta, Ga.
Geigy Agr. Chems., Div. Geigy Chem. Corp., N.Y.C.
Pennsylvania Salt Mfg. Co., of Wash., Tacoma, Wash.
Velsicol Chemical Corp., Chicago, Ill.

IRON CHELATES

Geigy Agr. Chems., Div. Geigy Chem. Corp., N.Y.C.
Tennessee Corp., Atlanta, Ga.

IRON SULFATE

Tennessee Corp., Atlanta, Ga.

LABORATORY SERVICES

Wisc. Alumni Research Foundation, Madison, Wisc.

LEAD ARSENATE

American Agricultural Chemical Co., N.Y.C.

LIMESTONE

American Agricultural Chemical Co., N.Y.C.
Ashcraft-Wilkinson Co., Atlanta, Ga.
National Lime & Stone Co., Finlay, Ohio

MACHINERY—Acid Making and Handling

Monarch Mfg. Works, Inc., Philadelphia, Pa.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Acidulating

Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Grinding and Pulverizing

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Bradley Pulverizer Co., Allentown, Pa.
Finco Inc., North Aurora, Ill.
Gruender Crusher and Pulverizer Co., St. Louis, Mo.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

Buyers' Guide

MACHINERY—Material Handling

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Clark Equip. Co., Construction Mach. Div., Benton Harbor, Mich.
Finco Inc., North Aurora, Ill.
Gründler Crusher and Pulverizer Co., St. Louis, Mo.
Hough, The Frank G. Co., Libertyville, Ill.
Joy Mfg. Co., Pittsburgh, Pa.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora Ind.
Stephen-Adams Mfg. Co., Aurora, Ill.
Sturtevant Mill Co., Boston, Mass.
Tractomotive Corp., Deerfield, Ill.

MACHINERY—Mixing and Blending

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Gründler Crusher and Pulverizer Co., St. Louis, Mo.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Mixing, Screening and Bagging

Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Power Transmission

Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY

Superphosphate Manufacturing

Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MALATHION

American Cyanamid Co., New York City

MANGANESE SULFATE

Tennessee Corp., Atlanta, Ga.

MANURE SALTS

Potash Co. of America, Washington, D. C.

METHOXYCHLOR

Geigy Agr. Chems., Div. Geigy Chem. Corp. N.Y.C.

MINOR ELEMENTS

Geigy Agr. Chems., Div. Geigy Chem. Corp. N.Y.C.
Tennessee Corporation, Atlanta, Ga.

MIXERS

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Rapid Machinery Co., Marion, Iowa
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

NITRATE OF SODA

Allied Chemical & Dye Corp., Nitrogen Div., N.Y.C.
American Agricultural Chemical Co., N.Y.C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N.Y.C.
International Min. & Chem. Corp., Chicago, Ill.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NITROGEN SOLUTIONS

Allied Chemical & Dye Corp., Nitrogen Div., N.Y.C.
American Cyanamid Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
E. I. duPont de Nemours & Co., Wilmington, Del.
Escambia Chem. Corp., Pensacola, Fla.
Mississippi River Chem. Co., St. Louis, Mo.
Phillips Chemical Co., Bartlesville, Okla.
Sinclair Chemicals, Chicago, Ill.
Sohio Chemical Co., Lima, O.

NITROGEN MATERIALS—Organic

American Agricultural Chemical Co., N.Y.C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N.Y.C.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray

Monarch Mfg. Works, Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

PAISLS—STEEL

Vulcan Steel Container Co., Birmingham, Ala.

PARATHION

American Cyanamid Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
Monsanto Chem. Co., St. Louis, Mo.

PHOSPHATE ROCK

American Agricultural Chemical Co., N.Y.C.
American Cyanamid Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N.Y.C.
International Min. & Chem. Corp., Chicago, Ill.
Woodward & Dickerson, Inc., Philadelphia, Pa.

PHOSPHORIC ACID

American Agricultural Chemical Co., N.Y.C.
Allied Chemical & Dye Corp., General Chemical Div., N.Y.C.

PLANT CONSTRUCTION—Fertilizer and Acid

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

POTASH—Muriate

American Potash & Chemical Corp., Los Angeles, California
Ashcraft-Wilkinson Co., (Duval Potash) Atlanta, Ga.
Bonneville, Ltd., Salt Lake City, Utah
Bradley & Baker, N.Y.C.
Duval Sulphur & Potash Co., Houston, Tex.
International Min. & Chem. Corp., Chicago, Ill.
National Potash Co., N.Y.C.
Potash Co. of America, Washington, D.C.
Southwest Potash Corp., New York City
United States Potash Co., N.Y.C.

POTASH—Sulfate

American Potash & Chemical Corp., Los Angeles, California
International Min. & Chem. Corp., Chicago, Ill.
Potash Co. of America, Washington, D.C.

PRINTING PRESSES—Bag

Schmütz Mfg. Co., Louisville, Ky.

PYROPHYLLITE

Ashcraft-Wilkinson Co., Atlanta, Ga.

REPAIR PARTS AND CASTINGS

Stedman Foundry and Machine Co., Aurora, Ind.

SCALES—Including Automatic Baggers

Exact Weight Scale Co., Columbus, O.
Stedman Foundry and Machine Co., Aurora, Ind.

SCREENS

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Finco Inc., North Aurora, Ill.
Ludlow-Saylor Wire Cloth Co., St. Louis, Mo.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

SCRUBBERS

Johnson-March, Philadelphia, Pa.

SOLVENTS

Richfield Oil Corp., Los Angeles, Calif.

SHOVEL LOADERS

Clark Equip. Co., Benton Harbor, Mich.
Hough, The Frank G. Co., Libertyville, Ill.
Tractomotive Corp., Deerfield, Ill.

SLUDGE

H. J. Baker & Bro., New York City

SOILTEST EQUIPMENT

The Edwards Laboratory, Norwalk, O.

SPRAYERS

Finco, Inc., N. Aurora, Ill.

SPRAYS

Monarch Mfg. Works, Inc., Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.
Baughman Mfg. Co., Jerseyville, Ill.

SPREADERS, TRUCK

Baughman Manufacturing Co., Jerseyville, Ill.

STORAGE TANKS

Cole, R. D., Manufacturing Co., Newnan, Ga.

SULFATE OF AMMONIA

Allied Chemical & Dye Corp., Nitrogen Div., N.Y.C.
American Agricultural Chemical Co., N.Y.C.
American Cyanamid Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N.Y.C.
Jackle, Frank R., New York City
Phillips Chemical Co., Bartlesville, Okla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFATE OF POTASH—MAGNESIA

International Min. & Chem. Corp., Chicago, Ill.

SULFUR

Ashcraft-Wilkinson Co., Atlanta, Ga.
Texas Gulf Sulphur Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFUR—Dusting & Spraying

Ashcraft-Wilkinson Co., Atlanta, Ga.
U. S. Phosphoric Products Div., Tennessee Corp., Tampa, Fla.

SULFURIC ACID

Allied Chemical & Dye Corp., General Chemical Div., N.Y.C.
American Agricultural Chemical Co., N.Y.C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N.Y.C.
International Min. & Chem. Corp., Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

SUPERPHOSPHATE

American Agricultural Chemical Co., N.Y.C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N.Y.C.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SUPERPHOSPHATE—Concentrated

American Cyanamid Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Bradley & Baker, N.Y.C.
Davison Chemical Co., Div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Phillips Chemical Co., Bartlesville, Okla.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TALC

Ashcraft-Wilkinson Co., Atlanta, Ga.

TANKAGE

American Agricultural Chemical Co., N.Y.C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N.Y.C.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

TANKS—NH₃ and Liquid N

Cole, R. D., Manufacturing Co., Newnan, Ga.

TOXAPHENE

Ashcraft-Wilkinson Co., Atlanta, Ga.

TRUCKS—SPREADER

Baughman Mfg. Co., Jerseyville, Ill.

UREA & UREA PRODUCTS

Allied Chemical & Dye Corp., Nitrogen Div., N.Y.C.
Bradley & Baker, N.Y.C.
E. I. duPont de Nemours & Co., Wilmington, Del.
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Sohio Chemical Co., Lima, O.

UREA-FORM

E. I. duPont de Nemours & Co., Wilmington, Del.
Nitro-Form Agricultural Chemicals, Woonsocket, R. I.

VALVES

Monarch Mfg. Works, Inc., Philadelphia, Pa.

ZINC SULFATE

Tennessee Corp., Atlanta, Ga.

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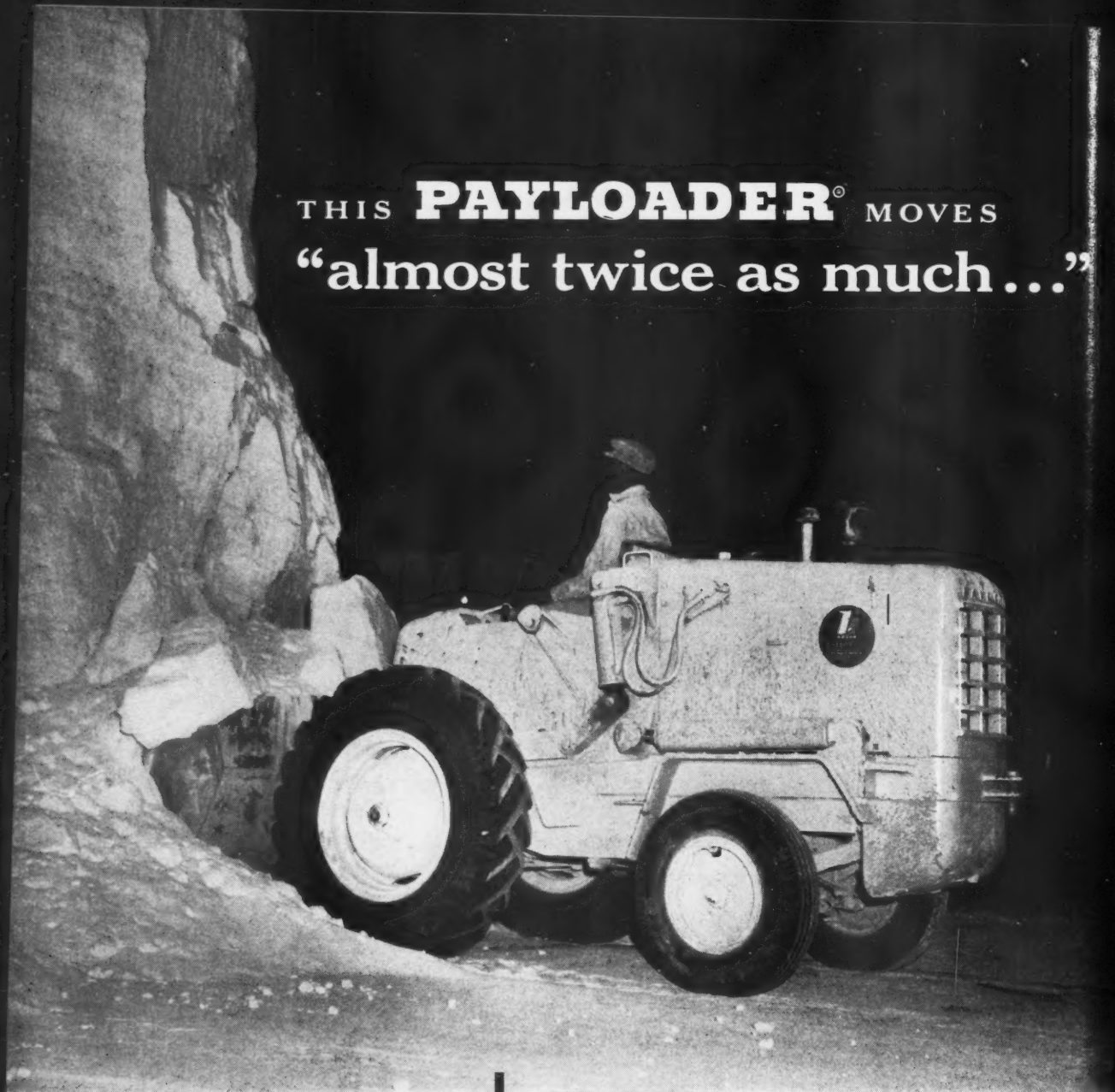
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